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THE

AMERICAN EPHEMERIS

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AND

NAUTICAL ALMANAC

FOR THE YEAR

1888

SECOND EDITION

PUBLISHED IN COMPLIANCE WITH A JOINT RESOLUTION OF THE FORTY-SIXTH CONGRESS

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WASHINGTON:
BUREAU OF NAVIGATION.
1887.

JOINT RESOLUTION

FOR PRINTING THE AMERICAN EPHEMERIS AND NAUTICAL ALMANAC.

Resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That there shall be printed annually at the Government Printing Office fifteen hundred copies of the American Ephemeris and Nautical Almanac and of the papers supplementary thereto, of which one hundred shall be for the use of the Senate, four hundred for the House of Representatives, and one thousand for the public service, to be distributed by the Navy Department.

Sec. 2 That additional copies of the Ephemeris and of the Nautical Almanac extracted therefrom may be ordered by the Secretary of the Navy for sale: Provided, That all moneys received from such sale shall be deposited in the Treasury to the credit of the appropriation for public printing.

Approved, February 11, 1880.

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PREFACE.

THE contents of the present volume of *The American Ephemeris* are, in general, similar to those of the volume for the preceding year. Beginning with the volume for the year 1882, the arrangement of the work is as follows:—

Part I, *Ephemeris for the Meridian of Greenwich*, gives the positions of the major planets, and other fundamental astronomical data for equidistant intervals of Greenwich mean time.

Part II, *Ephemeris for the Meridian of Washington*, gives the ephemerides of the fixed stars, sun, moon, and major planets for transit over the meridian of Washington. The mean places of the fixed stars and data for their reduction are also included in this Part. The list of mean and apparent places of fixed stars has been greatly enlarged, for the convenience of field-astronomers.

Part III, *Phenomena*, contains predictions of phenomena to be observed, with data for their computation. Washington mean time is used in this part except in a few cases, notably that of eclipses, where Greenwich mean time was judged more convenient. The additions comprise more complete data for eclipses of the sun, diagrams showing the configurations of the satellites of Jupiter, data respecting the disks of Mercury and Venus for the reduction of meridian and photometric observations, and diagrams, with tables, for identifying any known satellites of other planets.

SIMON NEWCOMB,
Professor U. S. Navy, Superintendent.

WASHINGTON, *July*, 1887.

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CORRECTION.

Ephemeris for 1888.

Pages 302—312, To the R. A. of α Ursæ Minoris apply the correction $-0^{s}.04$.

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CHRONOLOGICAL ERAS AND CYCLES.

CHRONOLOGICAL ERAS.

THE YEAR 1888, WHICH COMPRISES THE LATTER PART OF THE 112TH AND THE BEGINNING OF THE 113TH YEAR OF THE INDEPENDENCE OF THE UNITED STATES OF AMERICA, CORRESPONDS TO—

The year 6601 of the Julian Period;
" 7396–97 of the Byzantine era, the year 7397 commencing on September 1st;
" 5648–49 of the Jewish era, the year 5649 commencing on September 6th, or, more exactly, at sunset on September 5th;
" 2641 since the foundation of Rome, according to VARRO;
" 2635 since the beginning of the era of NABONASSAR, which has been assigned to Wednesday, the 26th of February of the 3967th year of the Julian Period: corresponding, in the notation of chronologists, to the 747th; and, in the notation of astronomers, to the 746th year before the birth of CHRIST;
" 2664 of the Olympiads, or the fourth year of the 666th Olympiad commencing in July, 1887, if we fix the era of the Olympiads at 775½ years before CHRIST, or near the beginning of July of the year 3938 of the Julian Period;
" 2200 of the Grecian era, or the era of the Seleucidæ;
" 1604 of the era of DIOCLETIAN;
" 2548 of the Japanese era and to the 21st year of the period entitled "Meiji."

The year 1306 of the Mohammedan era, or the era of the Hegira, begins on the 7th day of September, 1888.

The first day of January of the year 1888 is the 2,410,638th day since the commencement of the Julian Period.

CHRONOLOGICAL CYCLES.

Dominical Letter	A, G.	Solar Cycle	21
Epact	17	Roman Indiction	1
Lunar Cycle or Golden Number . . .	8	Julian Period	6601

SYMBOLS AND ABBREVIATIONS.

SIGNS OF THE PLANETS, ETC.

☉	The Sun.	♂	Mars.
☾	The Moon.	♃	Jupiter.
☿	Mercury.	♄	Saturn.
♀	Venus.	♅	Uranus.
⊕	The Earth.	♆	Neptune.

SIGNS OF THE ZODIAC.

Spring Signs.	1.	♈ Aries.	Autumn Signs.	7.	♎ Libra.
	2.	♉ Taurus.		8.	♏ Scorpius.
	3.	♊ Gemini.		9.	♐ Sagittarius
Summer Signs.	4.	♋ Cancer.	Winter Signs.	10.	♑ Capricornus.
	5.	♌ Leo.		11.	♒ Aquarius.
	6.	♍ Virgo.		12.	♓ Pisces.

ASPECTS.

☌ Conjunction, or having the same Longitude or Right Ascension.
□ Quadrature, or differing 90° in Longitude or Right Ascension.
☍ Opposition, or differing 180° in Longitude or Right Ascension.

ABBREVIATIONS.

☊	Ascending Node.	°	Degrees.
☋	Descending Node.	′	Minutes of Arc.
N.	North.	″	Seconds of Arc.
S.	South.	h	Hours.
E.	East.	m	Minutes of Time.
W.	West.	s	Seconds of Time.

PART I.

ASTRONOMICAL EPHEMERIS

FOR THE

MERIDIAN OF GREENWICH.

EPH 88—1—1

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.	Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Added to Apparent Time.	Diff. for 1 Hour.
		h m s	s	° ′ ″	″	′ ″	s	m s	s
SUN.	1	18 45 59.59	11.043	S. 23 1 50.5	+12.14	16 18.44	71.10	3 39.55	1.182
Mon.	2	18 50 24.45	11.029	22 56 45.5	13.28	16 18.43	71.06	4 7.77	1.169
Tues.	3	18 54 48.97	11.014	22 51 13.0	14.42	16 18.42	71.01	4 35.66	1.155
Wed.	4	18 59 13.14	10.999	22 45 13.2	+15.56	16 18.40	70.95	5 3.18	1.140
Thur.	5	19 3 36.91	10.982	22 38 46.4	16.69	16 18.38	70.89	5 30.32	1.123
Frid.	6	19 8 0.26	10.964	22 31 52.7	17.80	16 18.35	70.83	5 57.04	1.105
Sat.	7	19 12 23.17	10.945	22 24 32.2	+18.91	16 18.32	70.77	6 23.32	1.086
SUN.	8	19 16 45.61	10.924	22 16 45.2	20.00	16 18.28	70.70	6 49.13	1.065
Mon.	9	19 21 7.54	10.903	22 8 31.9	21.09	16 18.24	70.63	7 14.44	1.044
Tues.	10	19 25 28.95	10.881	21 59 52.6	+22.17	16 18.20	70.56	7 39.23	1.022
Wed.	11	19 29 49.80	10.857	21 50 47.5	23.24	16 18.15	70.48	8 3.46	0.998
Thur.	12	19 34 10.07	10.832	21 41 16.9	24.29	16 18.10	70.40	8 27.10	0.973
Frid.	13	19 38 29.73	10.806	21 31 21.1	+25.34	16 18.04	70.31	8 50.15	0.947
Sat.	14	19 42 48.75	10.779	21 21 0.3	26.37	16 17.98	70.22	9 12.56	0.920
SUN.	15	19 47 7.11	10.752	21 10 14.8	27.40	16 17.91	70.13	9 34.30	0.893
Mon.	16	19 51 24.79	10.723	20 59 5.0	+28.41	16 17.84	70.04	9 55.36	0.864
Tues.	17	19 55 41.77	10.693	20 47 31.1	29.39	16 17.77	69.94	10 15.72	0.835
Wed.	18	19 59 58.03	10.662	20 35 33.6	30.36	16 17.69	69.84	10 35.37	0.804
Thur.	19	20 4 13.54	10.631	20 23 12.7	+31.33	16 17.61	69.74	10 54.27	0.773
Frid.	20	20 8 28.28	10.599	20 10 28.9	32.28	16 17.53	69.64	11 12.41	0.741
Sat.	21	20 12 42.25	10.566	19 57 22.3	33.22	16 17.44	69.53	11 29.78	0.708
SUN.	22	20 16 55.43	10.533	19 43 53.4	+34.14	16 17.34	69.43	11 46.36	0.675
Mon.	23	20 21 7.82	10.500	19 30 2.7	35.05	16 17.24	69.32	12 2.15	0.642
Tues.	24	20 25 19.40	10.467	19 15 50.4	35.94	16 17.14	69.21	12 17.13	0.609
Wed.	25	20 29 30.17	10.433	19 1 16.9	+36.82	16 17.03	69.10	12 31.30	0.575
Thur.	26	20 33 40.13	10.398	18 46 22.5	37.68	16 16.91	68.99	12 44 66	0.541
Frid.	27	20 37 49.27	10.364	18 31 7.7	38.53	16 16.79	68.88	12 57.22	0.507
Sat.	28	20 41 57.59	10.330	18 15 32.8	+39.36	16 16.66	68.77	13 8.96	0.473
SUN.	29	20 46 5.09	10.296	17 59 38.3	40.17	16 16.53	68.65	13 19.88	0.439
Mon.	30	20 50 11.78	10.262	17 43 24.4	40.97	16 16.39	68.54	13 29.98	0.405
Tues.	31	20 54 17.66	10.228	17 26 51.6	41.75	16 16.24	68.42	13 39.27	0.371
Wed.	32	20 58 22.73	10.194	S. 17 10 0.3	+42.51	16 16.09	68.31	13 47.76	0.337

NOTE.—The mean time of semidiameter passing may be found by subtracting 0s.19 from the sidereal time.
The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Equation of Time, to be Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	m s	s	h m s
SUN.	1	18 45 58.92	11.039	S. 23 1 51.2	+12.13	3 39.47	1.182	18 42 19.45
Mon.	2	18 50 23.69	11.025	22 56 46.4	13.27	4 7.69	1.169	18 46 16.00
Tues.	3	18 54 48.13	11.011	22 51 14.1	14.42	4 35.57	1.155	18 50 12.56
Wed.	4	18 59 12.21	10.996	22 45 14.5	+15.55	5 3.09	1.140	18 54 9.12
Thur.	5	19 3 35.90	10.979	22 38 47.9	16.68	5 30.22	1.123	18 58 5.68
Frid.	6	19 7 59.17	10.961	22 31 54.4	17.79	5 56.94	1.105	19 2 2.23
Sat.	7	19 12 22.00	10.942	22 24 34.2	+18.90	6 23.21	1.086	19 5 58.79
SUN.	8	19 16 44.36	10.921	22 16 47.4	19.99	6 49.02	1.065	19 9 55.34
Mon.	9	19 21 6.22	10.900	22 8 34.4	21.08	7 14.32	1.044	19 13 51.90
Tues.	10	19 25 27.56	10.878	21 59 55.4	+22.16	7 39.11	1.022	19 17 48.45
Wed.	11	19 29 48.34	10.854	21 50 50.6	23.23	8 3.33	0.998	19 21 45.01
Thur.	12	19 34 8.54	10.829	21 41 20.3	24.28	8 26.97	0.973	19 25 41.57
Frid.	13	19 38 28.14	10.803	21 31 24.8	+25.33	8 50.01	0.947	19 29 38.13
Sat.	14	19 42 47.10	10.776	21 21 4.3	26.36	9 12.42	0.920	19 33 34.68
SUN.	15	19 47 5.40	10.749	21 10 19.1	27.39	9 34.16	0.893	19 37 31.24
Mon.	16	19 51 23.02	10.720	20 59 9.6	+28.40	9 55.22	0.864	19 41 27.80
Tues.	17	19 55 39.94	10.691	20 47 36.1	29.39	10 15.58	0.835	19 45 24.36
Wed.	18	19 59 56.14	10.660	20 35 38.9	30.35	10 35.23	0.804	19 49 20.91
Thur.	19	20 4 11.60	10.629	20 23 18.4	+31.33	10 54.13	0.773	19 53 17.47
Frid.	20	20 8 26.30	10.597	20 10 34.9	32.28	11 12.27	0.741	19 57 14.02
Sat.	21	20 12 40.22	10.564	19 57 28.7	33.22	11 29.64	0.708	20 1 10.58
SUN.	22	20 16 53.36	10.531	19 44 0.2	+34.14	11 46.23	0.675	20 5 7.13
Mon.	23	20 21 5.71	10.498	19 30 9.8	35.05	12 2.02	0.642	20 9 3.69
Tues.	24	20 25 17.25	10.465	19 15 57.8	35.94	12 17.00	0.609	20 13 0.25
Wed.	25	20 29 27.99	10.431	19 1 24.6	+36.82	12 31.18	0.575	20 16 56.81
Thur.	26	20 33 37.92	10.397	18 46 30.5	37.68	12 44.55	0.541	20 20 53.36
Frid.	27	20 37 47.03	10.363	18 31 16.0	38.52	12 57.11	0.507	20 24 49.92
Sat.	28	20 41 55 33	10.329	18 15 41.4	+39.35	13 8.86	0.473	20 28 46.47
SUN.	29	20 46 2.81	10.295	17 59 47.2	40.16	13 19.78	0.439	20 32 43.03
Mon.	30	20 50 9.47	10.261	17 43 33.6	40.96	13 29.89	0.405	20 36 39.58
Tues.	31	20 54 15 33	10.227	17 27 1.1	41.74	13 39.19	0.371	20 40 36.14
Wed.	32	20 58 20.38	10.193	S. 17 10 10.0	+42.50	13 47.69	0.337	20 44 32.69

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing.

Diff. for 1 hour, +9ˢ.8565. (Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S TRUE LONGITUDE. λ	THE SUN'S TRUE LONGITUDE. λ'	Diff. for 1 Hour.	THE SUN'S LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
								h m s
1	1	280° 34′ 26″.4	34′ 39″.2	152″.87	+ 0″.39	9.9926421	+ 0.3	5 16 48.50
2	2	281 35 35.3	35 47.9	152.87	0.52	9.9926442	1.4	5 12 52.59
3	3	282 36 44.4	36 56.8	152.88	0.63	9.9926489	2.5	5 8 56.69
4	4	283 37 53.6	38 5.8	152.88	+ 0.72	9.9926563	+ 3.5	5 5 0.78
5	5	284 39 2.9	39 14.9	152.89	0.80	9.9926662	4.6	5 1 4.86
6	6	285 40 12.4	40 24.2	152.89	0.86	9.9926785	5.6	4 57 8.95
7	7	286 41 22.0	41 33.7	152.90	+ 0.90	9.9926930	+ 6.5	4 53 13.04
8	8	287 42 31.7	42 43.2	152.90	0.91	9.9927097	7.3	4 49 17.13
9	9	288 43 41.4	43 52.7	152.90	0.88	9.9927284	8.1	4 45 21.22
10	10	289 44 51.0	45 2.2	152.90	+ 0.82	9.9927489	+ 8.9	4 41 25.31
11	11	290 46 0.5	46 11.6	152.89	0.73	9.9927711	9.6	4 37 29.40
12	12	291 47 9.8	47 20.7	152.88	0.62	9.9927949	10.3	4 33 33.49
13	13	292 48 18.8	48 29.5	152.86	+ 0.50	9.9928204	+11.0	4 29 37.58
14	14	293 49 27.3	49 37.8	152.84	0.37	9.9928476	11.7	4 25 41.67
15	15	294 50 35.3	50 45.7	152.82	0.23	9.9928764	12.3	4 21 45.76
16	16	295 51 42.7	51 53.0	152.79	+ 0.09	9.9929068	+13.0	4 17 49.85
17	17	296 52 49.4	52 59.5	152.76	− 0.03	9.9929390	13.7	4 13 53.93
18	18	297 53 55.3	54 5.2	152.72	0.15	9.9929730	14.4	4 9 58.02
19	19	298 55 0.2	55 10.0	152.68	− 0.23	9.9930087	+15.2	4 6 2.11
20	20	299 56 4.1	56 13.8	152.64	0.30	9.9930462	16.0	4 2 6.20
21	21	300 57 7.1	57 16.7	152.60	0.34	9.9930857	16.9	3 58 10.29
22	22	301 58 9.1	58 18.5	152.56	− 0.34	9.9931275	+17.9	3 54 14.38
23	23	302 59 10.0	59 19.2	152.52	0.31	9.9931716	18.9	3 50 18.47
24	24	304 0 9.9	0 19.0	152.48	0.26	9.9932182	19.9	3 46 22.56
25	25	305 1 8.7	1 17.7	152.43	− 0.17	9.9932673	+21.0	3 42 26.65
26	26	306 2 6.4	2 15.3	152.39	− 0.07	9.9933189	22.0	3 38 30.74
27	27	307 3 3.1	3 11.8	152.34	+ 0.04	9.9933730	23.1	3 34 34.83
28	28	308 3 58.8	4 7.3	152.30	+ 0.16	9.9934297	+24.1	3 30 38.92
29	29	309 4 53.5	5 1.9	152.26	0.29	9.9934890	25.2	3 26 43.01
30	30	310 5 47.2	5 55.5	152.22	0.41	9.9935508	26.2	3 22 47.10
31	31	311 6 40.0	6 48.2	152.18	0.52	9.9936152	27.3	3 18 51.19
32	32	312 7 31.9	7 39.9	152.14	+ 0.61	9.9936820	+28.3	3 14 55.28

NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ', to the mean equinox of January $0^d.0$.

Diff. for 1 Hour, $-9^s.8296$. (Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER. Noon.	SEMIDIAMETER. Midnight.	HORIZONTAL PARALLAX. Noon.	Diff. for 1 Hour.	HORIZONTAL PARALLAX. Midnight.	Diff. for 1 Hour.	UPPER TRANSIT. Meridian of Greenwich.	Diff. for 1 Hour.	AGE. Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	15 42.9	15 46.6	57 33.6	+1.17	57 47.2	+1.10	14 25.2	2.23	17.7
2	15 50.1	15 53.3	57 59.9	1.03	58 11.8	0.95	15 18.1	2.18	18.7
3	15 56.3	15 59.0	58 22.8	0.88	58 32.9	0.80	16 9.8	2.13	19.7
4	16 1.5	16 3.8	58 42.1	+0.73	58 50.5	+0.66	17 0.6	2.11	20.7
5	16 5.9	16 7.7	58 58.0	0.59	59 4.6	0.51	17 51.1	2.11	21.7
6	16 9.2	16 10.5	59 10.3	0.43	59 15.0	0.34	18 42.1	2.14	22.7
7	16 11.4	16 12.0	59 18.5	+0.24	59 20.7	+0.13	19 34.3	2.21	23.7
8	16 12.3	16 12.1	59 21.6	+0.01	59 20.9	−0.13	20 28.2	2.29	24.7
9	16 11.4	16 10.3	59 18.5	−0.28	59 14.2	0.44	21 24.1	2.36	25.7
10	16 8.6	16 6.3	59 7.9	−0.61	58 59.6	−0.78	22 21.5	2.40	26.7
11	16 3.5	16 0.1	58 49.2	0.95	58 36.8	1.11	23 19.2	2.39	27.7
12	15 56.2	15 51.8	58 22.5	1.27	58 6.4	1.41	6		28.7
13	15 47.0	15 41.9	57 48.8	−1.52	57 30.0	−1.60	0 15.8	2.32	0.1
14	15 36.6	15 31.1	57 10.4	1.66	56 50.3	1.68	1 10.2	2.20	1.1
15	15 25.6	15 20.1	56 30.0	1.68	56 9.9	1.65	2 1.5	2.07	2.1
16	15 14.8	15 9.8	55 50.5	−1.58	55 32.1	−1.48	2 49.7	1.95	3.1
17	15 5.1	15 0.9	55 14.9	1.36	54 59.5	1.21	3 35.2	1.84	4.1
18	14 57.2	14 54.1	54 45.9	1.05	54 34.4	0.86	4 18.6	1.78	5.1
19	14 51.6	14 49.8	54 25.2	−0.66	54 18.5	−0.45	5 0.7	1.74	6.1
20	14 48.6	14 48.2	54 14.4	−0.23	54 12.9	−0.02	5 42.5	1.75	7.1
21	14 48.5	14 49.6	54 14.0	+0.21	54 17.9	+0.43	6 24.8	1.78	8.1
22	14 51.3	14 53.8	54 24.3	+0.64	54 33.3	+0.85	7 8.4	1.85	9.1
23	14 56.9	15 0.6	54 44.7	1.04	54 58.3	1.22	7 53.9	1.95	10.1
24	15 4.8	15 9.6	55 13.9	1.38	55 31.3	1.51	8 41.9	2.06	11.1
25	15 14.7	15 20.1	55 50.2	+1.62	56 10.1	+1.70	9 32.5	2.16	12.1
26	15 25.8	15 31.5	56 30.9	1.75	56 52.0	1.76	10 25.5	2.25	13.1
27	15 37.3	15 42.9	57 13.1	1.74	57 33.7	1.68	11 20.1	2.29	14.1
28	15 48.3	15 53 4	57 53.5	+1.60	58 12.1	+1.48	12 15.2	2.30	15.1
29	15 58.0	16 2.1	58 29.1	1.34	58 44.3	1.18	13 10.0	2.26	16.1
30	16 5.7	16 8.7	58 57.5	1.00	59 8.4	0.81	14 3.7	2.21	17.1
31	16 11.0	16 12.7	59 16.9	0.62	59 23.2	0.43	14 56.3	2.17	18.1
32	16 13.8	16 14.4	59 27.3	+0.25	59 29.2	+0.08	15 48.0	2.14	19.1

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	8 36 24.70	2.3302	N.18 19 5.9	5.449
1	8 38 44.48	2.3291	18 13 35.7	5.557
2	8 41 4.19	2.3280	18 7 59.0	5.665
3	8 43 23.84	2.3269	18 2 15.9	5.772
4	8 45 43.42	2.3257	17 56 26.3	5.880
5	8 48 2.93	2.3245	17 50 30.3	5.987
6	8 50 22.36	2.3232	17 44 27.9	6.093
7	8 52 41.71	2.3219	17 38 19.1	6.199
8	8 55 0.99	2.3206	17 32 4.0	6.303
9	8 57 20.19	2.3193	17 25 42.7	6.407
10	8 59 39.31	2.3179	17 19 15.1	6.511
11	9 1 58.34	2.3164	17 12 41.3	6.614
12	9 4 17.28	2.3149	17 6 1.4	6.716
13	9 6 36.13	2.3134	16 59 15.4	6.819
14	9 8 54.89	2.3119	16 52 23.2	6.921
15	9 11 13.56	2.3103	16 45 24.9	7.022
16	9 13 32.13	2.3088	16 38 20.6	7.121
17	9 15 50.61	2.3072	16 31 10.4	7.219
18	9 18 8.99	2.3055	16 23 54.3	7.318
19	9 20 27.27	2.3038	16 16 32.3	7.416
20	9 22 45.45	2.3022	16 9 4.4	7.512
21	9 25 3.53	2.3005	16 1 30.8	7.608
22	9 27 21.51	2.2987	15 53 51.4	7.704
23	9 29 39.38	2.2970	N.15 46 6.3	7.798

MONDAY 2.

0	9 31 57.15	2.2952	N.15 38 15.6	7.892
1	9 34 14.81	2.2934	15 30 19.3	7.985
2	9 36 32.36	2.2917	15 22 17.4	8.077
3	9 38 49.81	2.2899	15 14 10.0	8.168
4	9 41 7.15	2.2880	15 5 57.2	8.258
5	9 43 24.37	2.2861	14 57 39.0	8.348
6	9 45 41.48	2.2842	14 49 15.4	8.437
7	9 47 58.48	2.2824	14 40 46.5	8.525
8	9 50 15.37	2.2806	14 32 12.4	8.613
9	9 52 32.15	2.2787	14 23 33.0	8.699
10	9 54 48.82	2.2768	14 14 48.5	8.783
11	9 57 5.37	2.2749	14 5 59.0	8.867
12	9 59 21.81	2.2731	13 57 4.4	8.951
13	10 1 38.14	2.2712	13 48 4.8	9.034
14	10 3 54.35	2.2693	13 39 0.3	9.116
15	10 6 10.45	2.2674	13 29 50.9	9.197
16	10 8 26.44	2.2656	13 20 36.6	9.277
17	10 10 42.32	2.2637	13 11 17.6	9.356
18	10 12 58.08	2.2618	13 1 53.9	9.434
19	10 15 13.73	2.2599	12 52 25.5	9.512
20	10 17 29.27	2.2581	12 42 52.5	9.588
21	10 19 44.70	2.2563	12 33 15.0	9.663
22	10 22 0.02	2.2544	12 23 33.0	9.737
23	10 24 15.23	2.2526	12 13 46.6	9.810
24	10 26 30.33	2.2507	N.12 3 55.8	9.882

TUESDAY 3.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	10 26 30.33	2.2507	N.12 3 55.8	9.882
1	10 28 45.32	2.2489	11 54 0.7	9.954
2	10 31 0.20	2.2472	11 44 1.3	10.025
3	10 33 14.98	2.2454	11 33 57.7	10.094
4	10 35 29.65	2.2436	11 23 50.0	10.162
5	10 37 44.21	2.2418	11 13 38.3	10.228
6	10 39 58.67	2.2401	11 3 22.6	10.295
7	10 42 13.03	2.2385	10 53 2.9	10.361
8	10 44 27.29	2.2368	10 42 39.3	10.425
9	10 46 41.44	2.2351	10 32 11.9	10.488
10	10 48 55.50	2.2335	10 21 40.7	10.551
11	10 51 9.46	2.2318	10 11 5.8	10.612
12	10 53 23.32	2.2302	10 0 27.2	10.673
13	10 55 37.09	2.2287	9 49 45.0	10.732
14	10 57 50.76	2.2271	9 38 59.4	10.789
15	11 0 4.34	2.2256	9 28 10.3	10.846
16	11 2 17.83	2.2242	9 17 17.8	10.903
17	11 4 31.24	2.2227	9 6 21.9	10.958
18	11 6 44.56	2.2213	8 55 22.8	11.011
19	11 8 57.80	2.2199	8 44 20.5	11.064
20	11 11 10.95	2.2185	8 33 15.1	11.117
21	11 13 24.02	2.2172	8 22 6.5	11.168
22	11 15 37.01	2.2158	8 10 54.9	11.217
23	11 17 49.92	2.2146	N. 7 59 40.4	11.266

WEDNESDAY 4.

0	11 20 2.76	2.2133	N. 7 48 23.0	11.313
1	11 22 15.52	2.2121	7 37 2.8	11.360
2	11 24 28.21	2.2110	7 25 39.8	11.406
3	11 26 40.84	2.2099	7 14 14.1	11.450
4	11 28 53.40	2.2088	7 2 45.8	11.493
5	11 31 5.90	2.2078	6 51 14.9	11.535
6	11 33 18.34	2.2068	6 39 41.6	11.576
7	11 35 30.72	2.2058	6 28 5.8	11.617
8	11 37 43.04	2.2048	6 16 27.6	11.656
9	11 39 55.30	2.2039	6 4 47.1	11.693
10	11 42 7.51	2.2031	5 53 4.4	11.730
11	11 44 19.68	2.2024	5 41 19.5	11.766
12	11 46 31.80	2.2017	5 29 32.5	11.801
13	11 48 43.88	2.2009	5 17 43.4	11.834
14	11 50 55.91	2.2002	5 5 52.4	11.866
15	11 53 7.90	2.1996	4 53 59.5	11.897
16	11 55 19.86	2.1990	4 42 4.7	11.927
17	11 57 31.78	2.1984	4 30 8.2	11.956
18	11 59 43.67	2.1979	4 18 10.0	11.984
19	12 1 55.53	2.1975	4 6 10.1	12.012
20	12 4 7.37	2.1972	3 54 8.6	12.038
21	12 6 19.19	2.1968	3 42 5.6	12.062
22	12 8 30.99	2.1965	3 30 1.2	12.084
23	12 10 42.77	2.1963	3 17 55.5	12.106
24	12 12 54.54	2.1961	N. 3 5 48.5	12.127

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	THURSDAY 5.			
	h m s	s	° ′ ″	″
0	12 12 54.54	2.1961	N. 3 5 48.5	12.127
1	12 15 6.30	2.1959	2 53 40.2	12.148
2	12 17 18.05	2.1958	2 41 30.7	12.167
3	12 19 29.79	2.1957	2 29 20.1	12.185
4	12 21 41.53	2.1957	2 17 8.5	12.202
5	12 23 53.27	2.1957	2 4 55.9	12.217
6	12 26 5.02	2.1958	1 52 42.5	12.231
7	12 28 16.77	2.1959	1 40 28.2	12.245
8	12 30 28.53	2.1961	1 28 13.1	12.257
9	12 32 40.31	2.1964	1 15 57.4	12.267
10	12 34 52.10	2.1967	1 3 41.1	12.277
11	12 37 3.91	2.1971	0 51 24.2	12.286
12	12 39 15.75	2.1975	0 39 6.8	12.293
13	12 41 27.61	2.1979	0 26 49.0	12.300
14	12 43 39.50	2.1983	0 14 30.8	12.305
15	12 45 51.41	2.1988	N. 0 2 12.4	12.309
16	12 48 3.36	2.1995	S. 0 10 6.2	12.312
17	12 50 15.35	2.2002	0 22 25.0	12.313
18	12 52 27.38	2.2009	0 34 43.8	12.313
19	12 54 39.46	2.2017	0 47 2.6	12.313
20	12 56 51.58	2.2024	0 59 21.4	12.312
21	12 59 3.75	2.2032	1 11 40.1	12.310
22	13 1 15.97	2.2042	1 23 58.6	12.305
23	13 3 28.25	2.2052	S. 1 36 16.7	12.299
	FRIDAY 6.			
0	13 5 40.59	2.2062	S. 1 48 34.4	12.292
1	13 7 52.99	2.2072	2 0 51.7	12.285
2	13 10 5.46	2.2083	2 13 8.6	12.277
3	13 12 17.99	2.2094	2 25 24.9	12.266
4	13 14 30.59	2.2107	2 37 40.5	12.255
5	13 16 43.27	2.2120	2 49 55.5	12.243
6	13 18 56.03	2.2133	3 2 9.7	12.229
7	13 21 8.87	2.2147	3 14 23.0	12.214
8	13 23 21.79	2.2160	3 26 35.4	12.198
9	13 25 34.79	2.2174	3 38 46.8	12.182
10	13 27 47.88	2.2190	3 50 57.2	12.163
11	13 30 1.07	2.2206	4 3 6.4	12.143
12	13 32 14.35	2.2222	4 15 14.4	12.122
13	13 34 27.73	2.2239	4 27 21.1	12.100
14	13 36 41.21	2.2256	4 39 26.4	12.077
15	13 38 54.80	2.2273	4 51 30.4	12.054
16	13 41 8.49	2.2291	5 3 32.9	12.028
17	13 43 22.29	2.2309	5 15 33.8	12.001
18	13 45 36.20	2.2328	5 27 33.0	11.973
19	13 47 50.23	2.2348	5 39 30.5	11.944
20	13 50 4.38	2.2367	5 51 26.3	11.914
21	13 52 18.64	2.2387	6 3 20.2	11.882
22	13 54 33.03	2.2408	6 15 12.1	11.849
23	13 56 47.54	2.2429	6 27 2.0	11.815
24	13 59 2.18	2.2451	S. 6 38 49.9	11.780

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY 7.			
	h m s	s	° ′ ″	″
0	13 59 2.18	2.2451	S. 6 38 49.9	11.780
1	14 1 16.95	2.2473	6 50 35.6	11.743
2	14 3 31.86	2.2496	7 2 19.1	11.706
3	14 5 46.90	2.2518	7 14 0.3	11.667
4	14 8 2.08	2.2541	7 25 39.1	11.627
5	14 10 17.40	2.2565	7 37 15.5	11.585
6	14 12 32.86	2.2589	7 48 49.3	11.542
7	14 14 48.47	2.2614	8 0 20.5	11.498
8	14 17 4.23	2.2638	8 11 49.1	11.454
9	14 19 20.13	2.2663	8 23 15.0	11.407
10	14 21 36.18	2.2689	8 34 38.0	11.359
11	14 23 52.39	2.2715	8 45 58.1	11.311
12	14 26 8.76	2.2741	8 57 15.3	11.261
13	14 28 25.28	2.2767	9 8 29.4	11.209
14	14 30 41.96	2.2794	9 19 40.4	11.157
15	14 32 58.81	2.2821	9 30 48.3	11.104
16	14 35 15.82	2.2848	9 41 52.9	11.049
17	14 37 32.99	2.2876	9 52 54.2	10.993
18	14 39 50.33	2.2904	10 3 52.1	10.936
19	14 42 7.84	2.2932	10 14 46.5	10.877
20	14 44 25.52	2.2961	10 25 37.4	10.817
21	14 46 43.37	2.2990	10 36 24.6	10.756
22	14 49 1.39	2.3019	10 47 8.1	10.694
23	14 51 19.59	2.3048	S. 10 57 47.9	10.631
	SUNDAY 8.			
0	14 53 37.96	2.3077	S. 11 8 23.8	10.566
1	14 55 56.51	2.3107	11 18 55.8	10.500
2	14 58 15.24	2.3136	11 29 23.8	10.433
3	15 0 34.14	2.3165	11 39 47.8	10.365
4	15 2 53.22	2.3196	11 50 7.6	10.295
5	15 5 12.49	2.3227	12 0 23.2	10.225
6	15 7 31.94	2.3257	12 10 34.6	10.153
7	15 9 51.57	2.3287	12 20 41.6	10.080
8	15 12 11.39	2.3318	12 30 44.2	10.006
9	15 14 31.39	2.3348	12 40 42.3	9.930
10	15 16 51.57	2.3379	12 50 35.8	9.852
11	15 19 11.94	2.3410	13 0 24.6	9.774
12	15 21 32.49	2.3441	13 10 8.7	9.696
13	15 23 53.23	2.3472	13 19 48.1	9.616
14	15 26 14.15	2.3502	13 29 22.6	9.534
15	15 28 35.26	2.3533	13 38 52.2	9.452
16	15 30 56.55	2.3564	13 48 16.8	9.368
17	15 33 18.03	2.3596	13 57 36.3	9.283
18	15 35 39.70	2.3627	14 6 50.7	9.197
19	15 38 1.55	2.3657	14 15 59.9	9.109
20	15 40 23.59	2.3688	14 25 3.8	9.021
21	15 42 45.81	2.3718	14 34 2.4	8.932
22	15 45 8.21	2.3749	14 42 55.6	8.841
23	15 47 30.80	2.3780	14 51 43.3	8.749
24	15 49 53.57	2.3810	S. 15 0 25.5	8.657

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	MONDAY 9.			
	h m s	s	° ′ ″	″
0	15 49 53.57	2.3810	S. 15 0 25.5	8.657
1	15 52 16.52	2.3840	15 9 2.1	8.563
2	15 54 39.65	2.3870	15 17 33.0	8.468
3	15 57 2.96	2.3900	15 25 58.2	8.372
4	15 59 26.45	2.3930	15 34 17.6	8.274
5	16 1 50.12	2.3959	15 42 31.1	8.176
6	16 4 13.96	2.3988	15 50 38.7	8.077
7	16 6 37.97	2.4017	15 58 40.3	7.977
8	16 9 2.16	2.4046	16 6 35.9	7.876
9	16 11 26.52	2.4074	16 14 25.4	7.773
10	16 13 51.05	2.4102	16 22 8.7	7.669
11	16 16 15.74	2.4129	16 29 45.7	7.564
12	16 18 40.60	2.4157	16 37 16.4	7.459
13	16 21 5.63	2.4184	16 44 40.8	7.353
14	16 23 30.81	2.4210	16 51 58.8	7.247
15	16 25 56.15	2.4237	16 59 10.4	7.139
16	16 28 21.65	2.4263	17 6 15.5	7.029
17	16 30 47.30	2.4288	17 13 13.9	6.918
18	16 33 13.11	2.4314	17 20 5.7	6.807
19	16 35 39.07	2.4338	17 26 50.8	6.696
20	16 38 5.17	2.4362	17 33 29.2	6.583
21	16 40 31.41	2.4385	17 40 0.8	6.470
22	16 42 57.79	2.4408	17 46 25.6	6.356
23	16 45 24.31	2.4431	S. 17 52 43.5	6.240
	TUESDAY 10.			
0	16 47 50.97	2.4454	S. 17 58 54.4	6.123
1	16 50 17.76	2.4475	18 4 58.3	6.007
2	16 52 44.67	2.4496	18 10 55.2	5.890
3	16 55 11.71	2.4517	18 16 45.1	5.772
4	16 57 38.87	2.4536	18 22 27.9	5.653
5	17 0 6.14	2.4554	18 28 3.5	5.533
6	17 2 33.52	2.4573	18 33 31.8	5.412
7	17 5 1.01	2.4591	18 38 52.9	5.291
8	17 7 28.61	2.4608	18 44 6.7	5.169
9	17 9 56.31	2.4625	18 49 13.2	5.047
10	17 12 24.11	2.4641	18 54 12.4	4.924
11	17 14 52.00	2.4656	18 59 4.1	4.800
12	17 17 19.98	2.4670	19 3 48.4	4.676
13	17 19 48.04	2.4683	19 8 25.2	4.551
14	17 22 16.18	2.4696	19 12 54.5	4.426
15	17 24 44.40	2.4709	19 17 16.3	4.300
16	17 27 12.69	2.4720	19 21 30.5	4.173
17	17 29 41.04	2.4731	19 25 37.1	4.047
18	17 32 9.46	2.4741	19 29 36.1	3.919
19	17 34 37.94	2.4750	19 33 27.4	3.791
20	17 37 6.46	2.4758	19 37 11.0	3.663
21	17 39 35.03	2.4765	19 40 47.0	3.535
22	17 42 3.64	2.4772	19 44 15.2	3.406
23	17 44 32.29	2.4778	19 47 35.7	3.277
24	17 47 0.97	2.4783	S. 19 50 48.4	3.147

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	WEDNESDAY 11.			
	h m s	s	° ′ ″	″
0	17 47 0.97	2.4783	S. 19 50 48.4	3.147
1	17 49 29.68	2.4787	19 53 53.3	3.017
2	17 51 58.41	2.4790	19 56 50.4	2.887
3	17 54 27.16	2.4792	19 59 39.7	2.757
4	17 56 55.92	2.4793	20 2 21.2	2.626
5	17 59 24.68	2.4793	20 4 54.8	2.495
6	18 1 53.44	2.4792	20 7 20.6	2.364
7	18 4 22.19	2.4792	20 9 38.5	2.233
8	18 6 50.94	2.4791	20 11 48.5	2.102
9	18 9 19.68	2.4788	20 13 50.7	1.971
10	18 11 48.40	2.4784	20 15 45.0	1.839
11	18 14 17.09	2.4779	20 17 31.4	1.707
12	18 16 45.74	2.4773	20 19 9.9	1.576
13	18 19 14.36	2.4767	20 20 40.5	1.444
14	18 21 42.94	2.4759	20 22 3.2	1.313
15	18 24 11.47	2.4750	20 23 18.1	1.181
16	18 26 39.94	2.4741	20 24 25.0	1.049
17	18 29 8.36	2.4731	20 25 24.0	0.918
18	18 31 36.71	2.4719	20 26 15.2	0.787
19	18 34 4.99	2.4707	20 26 58.5	0.656
20	18 36 33.20	2.4695	20 27 33.9	0.525
21	18 39 1.33	2.4681	20 28 1.5	0.394
22	18 41 29.37	2.4666	20 28 21.2	0.263
23	18 43 57.32	2.4650	S. 20 28 33.1	0.133
	THURSDAY 12.			
0	18 46 25.17	2.4633	S. 20 28 37.2	− 0.003
1	18 48 52.92	2.4616	20 28 33.5	+ 0.127
2	18 51 20.56	2.4597	20 28 22.0	0.257
3	18 53 48.09	2.4578	20 28 2.7	0.386
4	18 56 15.50	2.4558	20 27 35.7	0.514
5	18 58 42.79	2.4537	20 27 1.0	0.643
6	19 1 9.94	2.4514	20 26 18.5	0.771
7	19 3 36.96	2.4492	20 25 28.4	0.899
8	19 6 3.85	2.4469	20 24 30.6	1.026
9	19 8 30.59	2.4444	20 23 25.2	1.153
10	19 10 57.18	2.4419	20 22 12.2	1.280
11	19 13 23.62	2.4393	20 20 51.6	1.406
12	19 15 49.90	2.4367	20 19 23.5	1.531
13	19 18 16.02	2.4339	20 17 47.9	1.656
14	19 20 41.97	2.4310	20 16 4.8	1.781
15	19 23 7.74	2.4280	20 14 14.2	1.905
16	19 25 33.33	2.4250	20 12 16.2	2.028
17	19 27 58.74	2.4219	20 10 10.9	2.150
18	19 30 23.96	2.4188	20 7 58.2	2.272
19	19 32 48.99	2.4156	20 5 38.2	2.393
20	19 35 13.83	2.4123	20 3 11.0	2.514
21	19 37 38.47	2.4089	20 0 36.5	2.635
22	19 40 2.90	2.4054	19 57 54.8	2.754
23	19 42 27.12	2.4019	19 55 6.0	2.873
24	19 44 51.13	2.3983	S. 19 52 10.1	2.991

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	FRIDAY 13.			
	h m s	s	° ′ ″	″
0	19 44 51.13	2.3983	S. 19 52 10.1	2.991
1	19 47 14.92	2.3947	19 49 7.1	3.108
2	19 49 38.49	2.3910	19 45 57.1	3.224
3	19 52 1.84	2.3872	19 42 40.2	3.339
4	19 54 24.96	2.3833	19 39 16.4	3.454
5	19 56 47.84	2.3794	19 35 45.7	3.568
6	19 59 10.49	2.3755	19 32 8.2	3.682
7	20 1 32.90	2.3715	19 28 23.9	3.794
8	20 3 55.07	2.3674	19 24 32.9	3.906
9	20 6 16.99	2.3632	19 20 35.2	4.017
10	20 8 38.66	2.3591	19 16 30.9	4.127
11	20 11 0.08	2.3549	19 12 20.0	4.236
12	20 13 21.25	2.3507	19 8 2.6	4.344
13	20 15 42.16	2.3463	19 3 38.7	4.451
14	20 18 2.81	2.3419	18 59 8.5	4.557
15	20 20 23.19	2.3374	18 54 31.9	4.662
16	20 22 43.30	2.3330	18 49 49.0	4.767
17	20 25 3.15	2.3286	18 44 59.8	4.871
18	20 27 22.73	2.3240	18 40 4.5	4.974
19	20 29 42.03	2.3194	18 35 3.0	5.076
20	20 32 1.06	2.3148	18 29 55.4	5.177
21	20 34 19.81	2.3102	18 24 41.8	5.276
22	20 36 38.28	2.3055	18 19 22.3	5.374
23	20 38 56.47	2.3008	S. 18 13 56.9	5.471
	SATURDAY 14.			
0	20 41 14.38	2.2961	S. 18 8 25.7	5.568
1	20 43 32.00	2.2913	18 2 48.7	5.665
2	20 45 49.33	2.2865	17 57 5.9	5.760
3	20 48 6.38	2.2817	17 51 17.5	5.854
4	20 50 23.14	2.2768	17 45 23.5	5.947
5	20 52 39.60	2.2719	17 39 23.9	6.038
6	20 54 55.77	2.2671	17 33 18.9	6.128
7	20 57 11.65	2.2622	17 27 8.5	6.218
8	20 59 27.23	2.2572	17 20 52.7	6.307
9	21 1 42.52	2.2523	17 14 31.6	6.395
10	21 3 57.51	2.2473	17 8 5.3	6.482
11	21 6 12.20	2.2424	17 1 33.8	6.567
12	21 8 26.60	2.2375	16 54 57.2	6.652
13	21 10 40.70	2.2325	16 48 15.6	6.735
14	21 12 54.50	2.2275	16 41 29.0	6.818
15	21 15 8.00	2.2225	16 34 37.4	6.900
16	21 17 21.20	2.2175	16 27 41.0	6.980
17	21 19 34.10	2.2125	16 20 39.8	7.060
18	21 21 46.70	2.2075	16 13 33.8	7.139
19	21 23 59.00	2.2025	16 6 23.1	7.217
20	21 26 11.00	2.1976	15 59 7.8	7.293
21	21 28 22.71	2.1926	15 51 48.0	7.367
22	21 30 34.12	2.1876	15 44 23.8	7.441
23	21 32 45.22	2.1825	15 36 55.1	7.515
24	21 34 56.02	2.1775	S. 15 29 22.0	7.587
	SUNDAY 15.			
0	21 34 56.02	2.1775	S. 15 29 22.0	7.587
1	21 37 6.52	2.1726	15 21 44.6	7.658
2	21 39 16.73	2.1677	15 14 3.0	7.728
3	21 41 26.64	2.1627	15 6 17.2	7.798
4	21 43 36.25	2.1577	14 58 27.3	7.866
5	21 45 45.57	2.1528	14 50 33.3	7.932
6	21 47 54.59	2.1479	14 42 35.4	7.998
7	21 50 3.32	2.1430	14 34 33.5	8.064
8	21 52 11.75	2.1381	14 26 27.7	8.128
9	21 54 19.89	2.1332	14 18 18.1	8.192
10	21 56 27.74	2.1284	14 10 4.7	8.253
11	21 58 35.30	2.1236	14 1 47.7	8.313
12	22 0 42.57	2.1188	13 53 27.1	8.373
13	22 2 49.55	2.1140	13 45 2.9	8.433
14	22 4 56.25	2.1092	13 36 35.1	8.492
15	22 7 2.66	2.1045	13 28 3.9	8.548
16	22 9 8.79	2.0998	13 19 29.3	8.604
17	22 11 14.64	2.0952	13 10 51.4	8.659
18	22 13 20.21	2.0905	13 2 10.2	8.713
19	22 15 25.50	2.0858	12 53 25.8	8.767
20	22 17 30.51	2.0812	12 44 38.2	8.819
21	22 19 35.25	2.0767	12 35 47.5	8.870
22	22 21 39.71	2.0722	12 26 53.8	8.920
23	22 23 43.91	2.0677	S. 12 17 57.1	8.969
	MONDAY 16.			
0	22 25 47.84	2.0632	S. 12 8 57.5	9.018
1	22 27 51.50	2.0587	11 59 55.0	9.066
2	22 29 54.89	2.0543	11 50 49.6	9.112
3	22 31 58.02	2.0499	11 41 41.5	9.157
4	22 34 0.88	2.0456	11 32 30.7	9.202
5	22 36 3.49	2.0413	11 23 17.2	9.246
6	22 38 5.84	2.0371	11 14 1.2	9.289
7	22 40 7.94	2.0329	11 4 42.6	9.331
8	22 42 9.79	2.0287	10 55 21.5	9.372
9	22 44 11.38	2.0245	10 45 58.0	9.412
10	22 46 12.73	2.0204	10 36 32.1	9.452
11	22 48 13.83	2.0163	10 27 3.8	9.491
12	22 50 14.69	2.0123	10 17 33.2	9.528
13	22 52 15.31	2.0083	10 8 0.4	9.564
14	22 54 15.69	2.0044	9 58 25.5	9.600
15	22 56 15.84	2.0005	9 48 48.4	9.636
16	22 58 15.75	1.9967	9 39 9.2	9.670
17	23 0 15.44	1.9929	9 29 28.0	9.703
18	23 2 14.90	1.9891	9 19 44.9	9.735
19	23 4 14.13	1.9854	9 9 59.8	9.767
20	23 6 13.15	1.9818	9 0 12.9	9.798
21	23 8 11.95	1.9782	8 50 24.1	9.828
22	23 10 10.53	1.9746	8 40 33.5	9.857
23	23 12 8.90	1.9710	8 30 41.2	9.886
24	23 14 7.05	1.9675	S. 8 20 47.2	9.914

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	TUESDAY 17.			
	h m s	s	° ′ ″	″
0	23 14 7.05	1.9675	S. 8 20 47.2	9.914
1	23 16 5.00	1.9641	8 10 51.5	9.941
2	23 18 2.75	1.9607	8 0 54.3	9.966
3	23 20 0.29	1.9573	7 50 55.6	9.991
4	23 21 57.63	1.9541	7 40 55.4	10.016
5	23 23 54.78	1.9509	7 30 53.7	10.040
6	23 25 51.74	1.9477	7 20 50.6	10.063
7	23 27 48.51	1.9446	7 10 46.1	10.086
8	23 29 45.09	1.9414	7 0 40.3	10.107
9	23 31 41.48	1.9384	6 50 33.3	10.128
10	23 33 37.70	1.9355	6 40 25.0	10.148
11	23 35 33.74	1.9325	6 30 15.5	10.167
12	23 37 29.60	1.9296	6 20 4.9	10.186
13	23 39 25.29	1.9268	6 9 53.2	10.204
14	23 41 20.82	1.9241	5 59 40.5	10.221
15	23 43 16.18	1.9214	5 49 26.7	10.237
16	23 45 11.38	1.9187	5 39 12.0	10.253
17	23 47 6.42	1.9160	5 28 56.3	10.269
18	23 49 1.30	1.9134	5 18 39.7	10.283
19	23 50 56.03	1.9109	5 8 22.3	10.297
20	23 52 50.61	1.9085	4 58 4.1	10.310
21	23 54 45.05	1.9061	4 47 45.1	10.322
22	23 56 39.34	1.9037	4 37 25.4	10.333
23	23 58 33.49	1.9014	S. 4 27 5.1	10.344
	WEDNESDAY 18.			
0	0 0 27.51	1.8992	S. 4 16 44.1	10.355
1	0 2 21.40	1.8970	4 6 22.5	10.365
2	0 4 15.15	1.8948	3 56 0.3	10.374
3	0 6 8.77	1.8927	3 45 37.6	10.383
4	0 8 2.27	1.8907	3 35 14.4	10.391
5	0 9 55.66	1.8888	3 24 50.7	10.398
6	0 11 48.93	1.8869	3 14 26.6	10.404
7	0 13 42.08	1.8850	3 4 2.2	10.410
8	0 15 35.13	1.8832	2 53 37.4	10.416
9	0 17 28.07	1.8814	2 43 12.3	10.420
10	0 19 20.90	1.8797	2 32 47.0	10.424
11	0 21 13.64	1.8781	2 22 21.4	10.428
12	0 23 6.28	1.8765	2 11 55.6	10.431
13	0 24 58.82	1.8749	2 1 29.7	10.433
14	0 26 51.27	1.8735	1 51 3.7	10.435
15	0 28 43.64	1.8722	1 40 37.5	10.437
16	0 30 35.93	1.8708	1 30 11.3	10.437
17	0 32 28.14	1.8695	1 19 45.1	10.436
18	0 34 20.27	1.8682	1 9 19.0	10.435
19	0 36 12.32	1.8670	0 58 52.9	10.434
20	0 38 4.31	1.8659	0 48 26.9	10.433
21	0 39 56.23	1.8648	0 38 1.0	10.431
22	0 41 48.09	1.8638	0 27 35.2	10.428
23	0 43 39.89	1.8628	0 17 9.7	10.424
24	0 45 31.63	1.8619	S. 0 6 44.4	10.420

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	THURSDAY 19.			
	h m s	s	° ′ ″	″
0	0 45 31.63	1.8619	S. 0 6 44.4	10.420
1	0 47 23.32	1.8611	N. 0 3 40.7	10.416
2	0 49 14.96	1.8602	0 14 5.5	10.410
3	0 51 6.55	1.8595	0 24 29.9	10.403
4	0 52 58.10	1.8588	0 34 53.9	10.397
5	0 54 49.61	1.8582	0 45 17.5	10.390
6	0 56 41.08	1.8576	0 55 40.7	10.382
7	0 58 32.52	1.8571	1 6 3.4	10.374
8	1 0 23.93	1.8567	1 16 25.6	10.366
9	1 2 15.32	1.8563	1 26 47.3	10.357
10	1 4 6.69	1.8559	1 37 8.5	10.348
11	1 5 58.03	1.8555	1 47 29.1	10.338
12	1 7 49.35	1.8553	1 57 49.1	10.328
13	1 9 40.66	1.8552	2 8 8.4	10.316
14	1 11 31.97	1.8551	2 18 27.0	10.303
15	1 13 23.27	1.8550	2 28 44.8	10.291
16	1 15 14.57	1.8550	2 39 1.9	10.278
17	1 17 5.87	1.8550	2 49 18.2	10.264
18	1 18 57.17	1.8551	2 59 33.6	10.250
19	1 20 48.48	1.8552	3 9 48.2	10.236
20	1 22 39.80	1.8555	3 20 2.0	10.222
21	1 24 31.14	1.8558	3 30 14.8	10.206
22	1 26 22.50	1.8561	3 40 26.7	10.190
23	1 28 13.87	1.8564	N. 3 50 37.6	10.173
	FRIDAY 20.			
0	1 30 5.26	1.8567	N. 4 0 47.4	10.155
1	1 31 56.68	1.8572	4 10 56.2	10.138
2	1 33 48.13	1.8578	4 21 3.9	10.120
3	1 35 39.62	1.8585	4 31 10.6	10.102
4	1 37 31.15	1.8592	4 41 16.1	10.082
5	1 39 22.72	1.8599	4 51 20.4	10.061
6	1 41 14.33	1.8606	5 1 23.4	10.040
7	1 43 5.99	1.8614	5 11 25.2	10.019
8	1 44 57.70	1.8622	5 21 25.7	9.997
9	1 46 49.46	1.8632	5 31 24.9	9.976
10	1 48 41.28	1.8642	5 41 22.8	9.954
11	1 50 33.16	1.8652	5 51 19.4	9.932
12	1 52 25.10	1.8662	6 1 14.6	9.908
13	1 54 17.11	1.8674	6 11 8.3	9.883
14	1 56 9.19	1.8686	6 21 0.5	9.858
15	1 58 1.34	1.8698	6 30 51.3	9.833
16	1 59 53.57	1.8711	6 40 40.5	9.807
17	2 1 45.88	1.8724	6 50 28.1	9.780
18	2 3 38.26	1.8737	7 0 14.1	9.753
19	2 5 30.73	1.8752	7 9 58.5	9.726
20	2 7 23.29	1.8767	7 19 41.2	9.698
21	2 9 15.94	1.8783	7 29 22.2	9.669
22	2 11 8.69	1.8800	7 39 1.5	9.641
23	2 13 1.54	1.8816	7 48 39.1	9.612
24	2 14 54.48	1.8833	N. 7 58 14.9	9.582

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY 21.			
	h m s	s	° ′ ″	″
0	2 14 54.48	1.8833	N. 7 58 14.9	9.582
1	2 16 47.53	1.8851	8 7 48.9	9.551
2	2 18 40.69	1.8868	8 17 21.0	9.519
3	2 20 33.95	1.8887	8 26 51.2	9.486
4	2 22 27.33	1.8907	8 36 19.4	9.453
5	2 24 20.83	1.8926	8 45 45.6	9.420
6	2 26 14.44	1.8946	8 55 9.8	9.387
7	2 28 8.18	1.8967	9 4 32.0	9.353
8	2 30 2.04	1.8988	9 13 52.1	9.318
9	2 31 56.03	1.9009	9 23 10.2	9.283
10	2 33 50.15	1.9032	9 32 26.1	9.247
11	2 35 44.41	1.9054	9 41 39.8	9.210
12	2 37 38.80	1.9077	9 50 51.3	9.172
13	2 39 33.33	1.9100	10 0 0.5	9.135
14	2 41 28.00	1.9124	10 9 7.5	9.097
15	2 43 22.82	1.9149	10 18 12.2	9.058
16	2 45 17.79	1.9174	10 27 14.5	9.018
17	2 47 12.91	1.9199	10 36 14.4	8.978
18	2 49 8.18	1.9225	10 45 11.9	8.937
19	2 51 3.61	1.9252	10 54 6.9	8.896
20	2 52 59.20	1.9278	11 2 59.4	8.854
21	2 54 54.94	1.9304	11 11 49.4	8.811
22	2 56 50.85	1.9332	11 20 36.8	8.768
23	2 58 46.93	1.9361	N.11 29 21.6	8.725
	SUNDAY 22.			
0	3 0 43.18	1.9389	N.11 38 3.8	8.681
1	3 2 39.60	1.9418	11 46 43.3	8.635
2	3 4 36.20	1.9447	11 55 20.0	8.589
3	3 6 32.97	1.9477	12 3 54.0	8.543
4	3 8 29.92	1.9507	12 12 25.2	8.496
5	3 10 27.05	1.9538	12 20 53.5	8.448
6	3 12 24.37	1.9569	12 29 19.0	8.400
7	3 14 21.88	1.9600	12 37 41.5	8.351
8	3 16 19.57	1.9631	12 46 1.1	8.302
9	3 18 17.45	1.9663	12 54 17.7	8.251
10	3 20 15.53	1.9696	13 2 31.2	8.200
11	3 22 13.81	1.9729	13 10 41.7	8.149
12	3 24 12.28	1.9762	13 18 49.1	8.097
13	3 26 10.95	1.9796	13 26 53.4	8.044
14	3 28 9.83	1.9831	13 34 54.4	7.990
15	3 30 8.92	1.9865	13 42 52.2	7.936
16	3 32 8.21	1.9899	13 50 46.7	7.881
17	3 34 7.71	1.9934	13 58 37.9	7.825
18	3 36 7.42	1.9970	14 6 25.7	7.769
19	3 38 7.35	2.0006	14 14 10.1	7.712
20	3 40 7.49	2.0041	14 21 51.1	7.654
21	3 42 7.84	2.0077	14 29 28.6	7 596
22	3 44 8.41	2.0114	14 37 2.6	7.537
23	3 46 9.21	2.0152	14 44 33.0	7.477
24	3 48 10.23	2.0189	N.14 51 59.8	7.417

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	MONDAY 23.			
	h m s	s	° ′ ″	″
0	3 48 10.23	2.0189	N.14 51 59.8	7.417
1	3 50 11.47	2.0226	14 59 23.0	7.355
2	3 52 12.94	2.0264	15 6 42.4	7.293
3	3 54 14.64	2.0302	15 13 58.1	7.230
4	3 56 16.56	2.0340	15 21 10.0	7.167
5	3 58 18.72	2.0379	15 28 18.1	7.103
6	4 0 21.11	2.0418	15 35 22.4	7.038
7	4 2 23.73	2.0457	15 42 22.7	6.973
8	4 4 26.59	2.0497	15 49 19.1	6.907
9	4 6 29.69	2.0536	15 56 11.5	6.839
10	4 8 33.02	2.0575	16 2 59.8	6.771
11	4 10 36.59	2.0615	16 9 44.0	6.702
12	4 12 40.40	2.0655	16 16 24.1	6.633
13	4 14 44.45	2.0696	16 23 0.0	6.563
14	4 16 48.75	2.0737	16 29 31.7	6.492
15	4 18 53.29	2.0777	16 35 59.1	6.421
16	4 20 58.07	2.0817	16 42 22.2	6.349
17	4 23 3.10	2.0858	16 48 41.0	6.277
18	4 25 8.37	2.0899	16 54 55.4	6.203
19	4 27 13.89	2.0941	17 1 5.3	6.128
20	4 29 19.66	2.0982	17 7 10.7	6.053
21	4 31 25.67	2.1023	17 13 11.6	5.976
22	4 33 31.93	2.1065	17 19 7.9	5.899
23	4 35 38.45	2.1107	N.17 24 59.5	5.822
	TUESDAY 24.			
0	4 37 45.22	2.1149	N.17 30 46.5	5.744
1	4 39 52.24	2.1191	17 36 28.8	5.665
2	4 41 59.51	2.1232	17 42 6.3	5.585
3	4 44 7.02	2.1273	17 47 39.0	5.504
4	4 46 14.78	2.1315	17 53 6.8	5.423
5	4 48 22.80	2.1357	17 58 29.7	5.341
6	4 50 31.07	2.1399	18 3 47.7	5.258
7	4 52 39.59	2.1441	18 9 0.7	5.174
8	4 54 48.36	2.1482	18 14 8.6	5.089
9	4 56 57.38	2.1524	18 19 11.4	5.004
10	4 59 6.65	2.1567	18 24 9.1	4.918
11	5 1 16.18	2.1609	18 29 1.6	4.832
12	5 3 25.96	2.1651	18 33 48.9	4.744
13	5 5 35.99	2.1692	18 38 30.9	4.656
14	5 7 46.27	2.1733	18 43 7.6	4.567
15	5 9 56.79	2.1774	18 47 39.0	4.477
16	5 12 7.56	2.1816	18 52 4.9	4.387
17	5 14 18.58	2.1857	18 56 25.4	4.296
18	5 16 29.85	2.1899	19 0 40.4	4.204
19	5 18 41.37	2.1940	19 4 49.9	4.112
20	5 20 53.13	2.1980	19 8 53.8	4.018
21	5 23 5.13	2.2020	19 12 52.0	3.924
22	5 25 17.37	2.2061	19 16 44.6	3.829
23	5 27 29.86	2.2102	19 20 31.5	3.733
24	5 29 42.59	2.2142	N.19 24 12.6	3.637

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 25.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	5 29 42.59	2.2142	N.19 24 12.6	3.637
1	5 31 55.56	2.2181	19 27 47.9	3.540
2	5 34 8.76	2.2220	19 31 17.4	3.442
3	5 36 22.20	2.2260	19 34 41.0	3.343
4	5 38 35.88	2.2299	19 37 58.6	3.244
5	5 40 49.79	2.2337	19 41 10.3	3.145
6	5 43 3.93	2.2376	19 44 16.0	3.045
7	5 45 18.30	2.2414	19 47 15.7	2.943
8	5 47 32.90	2.2452	19 50 9.2	2.841
9	5 49 47.73	2.2490	19 52 56.6	2.738
10	5 52 2.78	2.2527	19 55 37.8	2.635
11	5 54 18.05	2.2563	19 58 12.8	2.532
12	5 56 33.54	2.2600	20 0 41.6	2.427
13	5 58 49.25	2.2636	20 3 4.1	2.322
14	6 1 5.17	2.2672	20 5 20.2	2.216
15	6 3 21.31	2.2707	20 7 30.0	2.110
16	6 5 37.66	2.2742	20 9 33.4	2.003
17	6 7 54.22	2.2777	20 11 30.3	1.895
18	6 10 10.98	2.2811	20 13 20.8	1.787
19	6 12 27.95	2.2845	20 15 4.8	1.678
20	6 14 45.12	2.2878	20 16 42.2	1.568
21	6 17 2.48	2.2910	20 18 13.0	1.459
22	6 19 20.04	2.2942	20 19 37.3	1.349
23	6 21 37.79	2.2974	N.20 20 54.9	1.238

THURSDAY 26.

0	6 23 55.73	2.3006	N.20 22 5.8	1.126
1	6 26 13.86	2.3037	20 23 10.0	1.014
2	6 28 32.17	2.3067	20 24 7.5	0.901
3	6 30 50.66	2.3097	20 24 58.2	0.788
4	6 33 9.33	2.3126	20 25 42.1	0.675
5	6 35 28.17	2.3154	20 26 19.2	0.562
6	6 37 47.18	2.3183	20 26 49.5	0.448
7	6 40 6.36	2.3211	20 27 12.9	0.333
8	6 42 25.71	2.3238	20 27 29.4	0.217
9	6 44 45.22	2.3264	20 27 38.9	+ 0.101
10	6 47 4.88	2.3289	20 27 41.5	− 0.015
11	6 49 24.69	2.3314	20 27 37.1	0.132
12	6 51 44.65	2.3339	20 27 25.7	0.248
13	6 54 4.76	2.3364	20 27 7.3	0.365
14	6 56 25.02	2.3388	20 26 41.9	0.483
15	6 58 45.42	2.3411	20 26 9.4	0.601
16	7 1 5.95	2.3432	20 25 29.8	0.719
17	7 3 26.60	2.3453	20 24 43.1	0.837
18	7 5 47.38	2.3474	20 23 49.3	0.956
19	7 8 8.29	2.3495	20 22 48.4	1.075
20	7 10 29.32	2.3514	20 21 40.3	1.194
21	7 12 50.46	2.3533	20 20 25.1	1.313
22	7 15 11.72	2.3552	20 19 2.7	1.433
23	7 17 33.08	2.3569	20 17 33.1	1.553
24	7 19 54.55	2.3586	N.20 15 56.3	1.673

FRIDAY 27.

0	7 19 54.55	2.3586	N.20 15 56.3	1.673
1	7 22 16.12	2.3602	20 14 12.3	1.793
2	7 24 37.78	2.3618	20 12 21.1	1.913
3	7 26 59.54	2.3634	20 10 22.7	2.034
4	7 29 21.39	2.3648	20 8 17.0	2.155
5	7 31 43.32	2.3662	20 6 4.1	2.275
6	7 34 5.33	2.3675	20 3 44.0	2.396
7	7 36 27.42	2.3687	20 1 16.6	2.517
8	7 38 49.57	2.3698	19 58 42.0	2.637
9	7 41 11.79	2.3708	19 56 0.2	2.757
10	7 43 34.07	2.3719	19 53 11.1	2.878
11	7 45 56.42	2.3730	19 50 14.8	2.999
12	7 48 18.83	2.3739	19 47 11.2	3.120
13	7 50 41.29	2.3747	19 44 0.4	3.240
14	7 53 3.79	2.3754	19 40 42.4	3.361
15	7 55 26.33	2.3760	19 37 17.1	3.482
16	7 57 48.91	2.3767	19 33 44.6	3.602
17	8 0 11.53	2.3773	19 30 4.9	3.722
18	8 2 34.18	2.3777	19 26 18.0	3.842
19	8 4 56.85	2.3781	19 22 23.9	3.962
20	8 7 19.55	2.3785	19 18 22.6	4.082
21	8 9 42.27	2.3788	19 14 14.1	4.201
22	8 12 5.00	2.3790	19 9 58.5	4.319
23	8 14 27.75	2.3792	N.19 5 35.8	4.438

SATURDAY 28.

0	8 16 50.51	2.3793	N.19 1 5.9	4.557
1	8 19 13.27	2.3793	18 56 28.9	4.676
2	8 21 36.03	2.3793	18 51 44.8	4.793
3	8 23 58.78	2.3792	18 46 53.7	4.910
4	8 26 21.53	2.3790	18 41 55.6	5.028
5	8 28 44.26	2.3787	18 36 50.4	5.145
6	8 31 6.98	2.3785	18 31 38.2	5.261
7	8 33 29.68	2.3782	18 26 19.1	5.377
8	8 35 52.36	2.3778	18 20 53.0	5.493
9	8 38 15.01	2.3773	18 15 19.9	5.609
10	8 40 37.64	2.3768	18 9 39.9	5.723
11	8 43 0.23	2.3763	18 3 53.1	5.837
12	8 45 22.79	2.3757	17 57 59.5	5.950
13	8 47 45.31	2.3750	17 51 59.1	6.064
14	8 50 7.79	2.3742	17 45 51.9	6.177
15	8 52 30.22	2.3734	17 39 37.9	6.289
16	8 54 52.60	2.3726	17 33 17.2	6.400
17	8 57 14.93	2.3717	17 26 49.9	6.511
18	8 59 37.21	2.3708	17 20 15.9	6.622
19	9 1 59.43	2.3698	17 13 35.3	6.731
20	9 4 21.59	2.3688	17 6 48.2	6.839
21	9 6 43.69	2.3677	16 59 54.6	6.948
22	9 9 5.72	2.3667	16 52 54.5	7.056
23	9 11 27.69	2.3656	16 45 47.9	7.163
24	9 13 49.59	2.3644	N.16 38 34.9	7.269

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SUNDAY 29.			
	h m s	s	° ′ ″	″
0	9 13 49.59	2.3644	N.16 38 34.9	7.269
1	9 16 11.41	2.3631	16 31 15.6	7.374
2	9 18 33.16	2.3618	16 23 50.0	7.479
3	9 20 54.83	2.3605	16 16 18.1	7.583
4	9 23 16.42	2.3591	16 8 40.0	7.686
5	9 25 37.92	2.3577	16 0 55.8	7.789
6	9 27 59.34	2.3562	15 53 5.4	7.891
7	9 30 20.67	2.3548	15 45 8.9	7.991
8	9 32 41.92	2.3534	15 37 6.5	8.090
9	9 35 3.08	2.3518	15 28 58.1	8.189
10	9 37 24.14	2.3502	15 20 43.8	8.287
11	9 39 45.11	2.3487	15 12 23.6	8.385
12	9 42 5.98	2.3471	15 3 57.6	8.481
13	9 44 26.76	2.3454	14 55 25.9	8.577
14	9 46 47.43	2.3437	14 46 48.4	8.672
15	9 49 8.00	2.3420	14 38 5.3	8.765
16	9 51 28.47	2.3403	14 29 16.6	8.857
17	9 53 48.84	2.3386	14 20 22.4	8.949
18	9 56 9.11	2.3369	14 11 22.7	9.040
19	9 58 29.27	2.3351	14 2 17.6	9.129
20	10 0 49.32	2.3333	13 53 7.2	9.218
21	10 3 9.27	2.3316	13 43 51.5	9.306
22	10 5 29.11	2.3297	13 34 30.5	9.392
23	10 7 48.83	2.3279	N.13 25 4.4	9.477
	MONDAY 30.			
0	10 10 8.45	2.3261	N.13 15 33.2	9.562
1	10 12 27.96	2.3242	13 5 56.9	9.646
2	10 14 47.35	2.3223	12 56 15.7	9.728
3	10 17 6.63	2.3204	12 46 29.6	9.809
4	10 19 25.80	2.3186	12 36 38.6	9.890
5	10 21 44.86	2.3167	12 26 42.8	9.969
6	10 24 3.81	2.3148	12 16 42.3	10.047
7	10 26 22.64	2.3129	12 6 37.1	10.124
8	10 28 41.36	2.3111	11 56 27.4	10.199
9	10 30 59.97	2.3092	11 46 13.2	10.274
10	10 33 18.46	2.3072	11 35 54.5	10.347
11	10 35 36.84	2.3053	11 25 31.5	10.419
12	10 37 55.10	2.3034	11 15 4.2	10.490
13	10 40 13.25	2.3016	11 4 32.7	10.561
14	10 42 31.29	2.2997	10 53 56.9	10.631
15	10 44 49.22	2.2979	10 43 17.0	10.698
16	10 47 7.04	2.2960	10 32 33.1	10.764
17	10 49 24.74	2.2941	10 21 45.3	10.829
18	10 51 42.33	2.2923	10 10 53.6	10.893
19	10 53 59.82	2.2905	9 59 58.1	10.957
20	10 56 17.19	2.2886	9 48 58.8	11.018
21	10 58 34.45	2.2868	9 37 55.9	11.078
22	11 0 51.60	2.2850	9 26 49.4	11.138
23	11 3 8.65	2.2832	9 15 39.3	11.197
24	11 5 25.59	2.2815	N. 9 4 25.8	11.253

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	TUESDAY 31.			
	h m s	s	° ′ ″	″
0	11 5 25.59	.2815	N. 9 4 25.8	11.253
1	11 7 42.43	2.2797	8 53 9.0	11.308
2	11 9 59.16	2.2780	8 41 48.8	11.363
3	11 12 15.79	2.2763	8 30 25.4	11.416
4	11 14 32.32	2.2747	8 18 58.9	11.467
5	11 16 48.75	2.2730	8 7 29.3	11.518
6	11 19 5.08	2.2713	7 55 56.7	11.568
7	11 21 21.31	2.2697	7 44 21.1	11.617
8	11 23 37.45	2.2682	7 32 42.7	11.663
9	11 25 53.49	2.2666	7 21 1.6	11.708
10	11 28 9.44	2.2650	7 9 17.8	11.753
11	11 30 25.29	2.2634	6 57 31.3	11.796
12	11 32 41.05	2.2619	6 45 42.3	11.837
13	11 34 56.72	2.2605	6 33 50.9	11.877
14	11 37 12.31	2.2592	6 21 57.0	11.917
15	11 39 27.82	2.2578	6 10 0.8	11.955
16	11 41 43.25	2.2564	5 58 2.4	11.992
17	11 43 58.59	2.2550	5 46 1.8	12.028
18	11 46 13.85	2.2537	5 33 59.1	12.062
19	11 48 29.04	2.2525	5 21 54.4	12.094
20	11 50 44.15	2.2512	5 9 47.8	12.125
21	11 52 59.18	2.2499	4 57 39.4	12.155
22	11 55 14.14	2.2487	4 45 29.2	12.184
23	11 57 29.03	2.2476	N. 4 33 17.3	12.212
	WEDNESDAY, FEBRUARY 1.			
0	11 59 43.86	2.2466	N. 4 21 3.7	12.239

PHASES OF THE MOON.

		d	h	m
☾	Last Quarter . . Jan.	5	23	42.4
●	New Moon	12	20	38.6
☽	First Quarter	20	16	49.1
○	Full Moon	28	11	18.9

		d	h
☾	Perigee . . . . Jan.	8	0
☾	Apogee	20	12.1

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	III^h.	P. L. of Diff.	VI^h.	P. L. of Diff.	IX^h.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
1	Aldebaran	W.	58 41 7	2512	60 22 4	2504	62 3 12	2496	63 44 31	2489
	Mars	E.	66 8 27	2666	64 31 1	2657	62 53 24	2649	61 15 36	2642
	Spica	E.	75 29 32	2546	73 49 23	2539	72 9 4	2532	70 28 35	2525
	Venus	E.	109 18 16	2903	107 46 1	2894	106 13 35	2886	104 40 58	2877
2	Aldebaran	W.	72 13 37	2454	73 55 55	2448	75 38 22	2441	77 20 59	2434
	Pollux	W.	29 5 23	2642	30 43 21	2618	32 21 52	2596	34 0 52	2577
	Mars	E.	53 4 7	2607	51 25 21	2600	49 46 26	2593	48 7 22	2588
	Spica	E.	62 4 0	2495	60 22 40	2491	58 41 14	2487	56 59 42	2482
	Venus	E.	96 55 22	2841	95 21 47	2833	93 48 2	2826	92 14 8	2820
	Jupiter	E.	97 31 11	2525	95 50 32	2518	94 9 44	2512	92 28 47	2505
3	Aldebaran	W.	85 56 10	2405	87 39 37	2401	89 23 11	2395	91 6 53	2390
	Pollux	W.	42 21 45	2504	44 2 53	2492	45 44 17	2482	47 25 56	2472
	Saturn	W.	29 18 0	2385	31 1 56	2379	32 46 1	2374	34 30 13	2368
	Mars	E.	39 50 2	2560	38 10 12	2555	36 30 15	2551	34 50 12	2546
	Spica	E.	48 30 39	2466	46 48 38	2464	45 6 34	2462	43 24 28	2462
	Jupiter	E.	84 1 52	2475	82 20 4	2470	80 38 9	2465	78 56 7	2460
	Venus	E.	84 22 35	2788	82 47 52	2783	81 13 2	2778	79 38 5	2772
	Antares	E.	94 24 39	2461	92 42 31	2456	91 0 16	2450	89 17 53	2445
	Sun	E.	128 38 27	2745	127 2 47	2738	125 26 58	2732	123 51 1	2727
4	Pollux	W.	55 57 22	2431	57 40 13	2424	59 23 14	2417	61 6 24	2411
	Saturn	W.	43 13 7	2344	44 58 3	2339	46 43 5	2335	48 28 14	2331
	Regulus	W.	19 40 4	2373	21 24 17	2367	23 8 39	2362	24 53 8	2357
	Spica	E.	34 54 8	2472	33 12 15	2478	31 30 31	2486	29 48 58	2496
	Jupiter	E.	70 24 11	2436	68 41 28	2431	66 58 38	2428	65 15 43	2424
	Venus	E.	71 41 32	2747	70 5 54	2741	68 30 9	2737	66 54 18	2733
	Antares	E.	80 44 15	2423	79 1 13	2419	77 18 6	2415	75 34 53	2412
	Sun	E.	115 49 26	2699	114 12 45	2695	112 35 58	2689	110 59 4	2684
5	Pollux	W.	69 44 23	2383	71 28 22	2378	73 12 28	2374	74 56 40	2369
	Saturn	W.	57 15 31	2310	59 1 16	2306	60 47 7	2302	62 33 3	2298
	Regulus	W.	33 37 17	2335	35 22 26	2331	37 7 41	2327	38 53 1	2323
	Jupiter	E.	56 39 44	2405	54 56 17	2402	53 12 45	2399	51 29 9	2396
	Venus	E.	58 53 38	2711	57 17 13	2707	55 40 43	2704	54 4 8	2700
	Antares	E.	66 57 45	2399	65 14 9	2397	63 30 30	2395	61 46 48	2394
	Sun	E.	102 53 0	2663	101 15 30	2658	99 37 54	2654	98 0 12	2649
6	Saturn	W.	71 24 3	2282	73 10 29	2279	74 57 0	2276	76 43 35	2272
	Regulus	W.	47 41 3	2306	49 26 54	2302	51 12 50	2300	52 58 50	2296
	Jupiter	E.	42 50 14	2385	41 6 18	2384	39 22 20	2382	37 38 20	2382
	Venus	E.	46 0 4	2684	44 23 2	2681	42 45 57	2678	41 8 48	2675
	Antares	E.	53 8 5	2394	51 24 22	2396	49 40 41	2397	47 57 2	2400
	Sun	E.	89 50 23	2632	88 12 11	2628	86 33 54	2625	84 55 33	2621
7	Saturn	W.	85 37 33	2260	87 24 31	2258	89 11 33	2256	90 58 37	2254
	Regulus	W.	61 49 53	2284	63 36 16	2281	65 22 43	2280	67 9 12	2278
	Mars	W.	14 44 26	2481	16 26 6	2466	18 8 7	2455	19 50 24	2446
	Venus	E.	33 2 16	2666	31 24 50	2665	29 47 23	2664	28 9 55	2665
	Antares	E.	39 20 17	2430	37 37 25	2440	35 54 47	2453	34 12 27	2467
	Sun	E.	76 42 47	2608	75 4 3	2606	73 25 16	2604	71 46 26	2601

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^h.	P. L. of Diff.	XVIII^h.	P. L. of Diff.	XXI^h.	P. L. of Diff.
1	Aldebaran	W.	65° 26′ 0″	2481	67° 7′ 40″	2474	68° 49′ 30″	2467	70° 31′ 29″	2461
	Mars	E.	59 37 38	2635	57 59 30	2627	56 21 12	2620	54 42 44	2613
	Spica	E.	68 47 57	2520	67 7 11	2513	65 26 16	2507	63 45 12	2501
	Venus	E.	103 8 10	2869	101 35 12	2862	100 2 5	2855	98 28 48	2848
2	Aldebaran	W.	79 3 45	2429	80 46 39	2423	82 29 41	2417	84 12 51	2411
	Pollux	W.	35 40 18	2560	37 20 8	2544	39 0 20	2529	40 40 53	2515
	Mars	E.	46 28 10	2581	44 48 49	2576	43 9 21	2570	41 29 45	2565
	Spica	E.	55 18 4	2478	53 36 20	2475	51 54 31	2471	50 12 37	2468
	Venus	E.	90 40 6	2814	89 5 56	2807	87 31 37	2801	85 57 10	2795
	Jupiter	E.	90 47 41	2499	89 6 26	2493	87 25 3	2487	85 43 32	2481
3	Aldebaran	W.	92 50 42	2384	94 34 39	2380	96 18 43	2375	98 2 53	2371
	Pollux	W.	49 7 49	2463	50 49 54	2454	52 32 12	2445	54 14 42	2438
	Saturn	W.	36 14 33	2363	37 59 1	2358	39 43 36	2353	41 28 18	2348
	Mars	E.	33 10 3	2542	31 29 48	2538	29 49 28	2535	28 9 4	2533
	Spica	E.	41 42 21	2462	40 0 15	2463	38 18 10	2465	36 36 7	2467
	Jupiter	E.	77 13 58	2455	75 31 41	2450	73 49 18	2445	72 6 48	2441
	Venus	E.	78 3 0	2766	76 27 48	2761	74 52 29	2756	73 17 4	2751
	Antares	E.	87 35 23	2441	85 52 46	2436	84 10 2	2431	82 27 12	2426
	Sun	E.	122 14 57	2721	120 38 45	2716	119 2 26	2710	117 26 0	2704
4	Pollux	W.	62 49 43	2405	64 33 11	2399	66 16 47	2394	68 0 31	2388
	Saturn	W.	50 13 29	2326	51 58 50	2322	53 44 18	2317	55 29 52	2314
	Regulus	W.	26 37 44	2353	28 22 27	2348	30 7 17	2343	31 52 14	2339
	Spica	E.	28 7 39	2509	26 26 38	2526	24 46 1	2548	23 5 54	2577
	Jupiter	E.	63 32 42	2419	61 49 35	2416	60 6 23	2412	58 23 6	2409
	Venus	E.	65 18 22	2729	63 42 20	2724	62 6 12	2719	60 29 58	2715
	Antares	E.	73 51 36	2409	72 8 14	2406	70 24 48	2403	68 41 18	2401
	Sun	E.	109 22 3	2680	107 44 56	2675	106 7 43	2671	104 30 24	2667
5	Pollux	W.	76 40 59	2365	78 25 24	2361	80 9 55	2357	81 54 31	2353
	Saturn	W.	64 19 5	2295	66 5 12	2291	67 51 24	2288	69 37 41	2285
	Regulus	W.	40 38 27	2320	42 23 58	2315	44 9 35	2312	45 55 17	2309
	Jupiter	E.	49 45 29	2394	48 1 46	2391	46 17 59	2389	44 34 8	2387
	Venus	E.	52 27 28	2697	50 50 44	2693	49 13 55	2690	47 37 2	2687
	Antares	E.	60 3 5	2394	58 19 21	2393	56 35 36	2392	54 51 50	2393
	Sun	E.	96 22 24	2646	94 44 31	2642	93 6 33	2638	91 28 30	2635
6	Saturn	W.	78 30 15	2270	80 16 59	2267	82 3 47	2265	83 50 38	2262
	Regulus	W.	54 44 55	2294	56 31 4	2291	58 17 17	2289	60 3 33	2286
	Jupiter	E.	35 54 20	2382	34 10 20	2382	32 26 20	2383	30 42 21	2385
	Venus	E.	39 31 35	2673	37 54 19	2672	36 17 1	2669	34 39 40	2667
	Antares	E.	46 13 27	2404	44 29 58	2408	42 46 35	2415	41 3 21	2422
	Sun	E.	83 17 7	2618	81 38 37	2616	80 0 4	2613	78 21 27	2611
	Saturn	W.	92 45 44	2252	94 32 54	2251	96 20 6	2250	98 7 19	2249
	Regulus	W.	68 55 44	2276	70 42 19	2274	72 28 56	2274	74 15 34	2273
	Mars	W.	21 32 53	2440	23 15 31	2434	24 58 17	2429	26 41 10	2425
	Venus	E.	26 32 28	2665	24 55 1	2666	23 17 35	2666	21 40 10	2669
	Antares	E.	32 30 28	2485	30 48 53	2506	29 7 48	2533	27 27 20	2566
	Sun	E.	70 7 33	2600	68 28 38	2599	66 49 41	2597	65 10 42	2596

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	III^h.	P. L. of Diff.	VI^h.	P. L. of Diff.	IX^h.	P. L. of Diff.
8	Regulus	W.	76° 2′ 13″	2272	77° 48′ 54″	2271	79° 35′ 36″	2270	81° 22′ 20″	2270
	Mars	W.	28 24 9	2422	30 7 12	2419	31 50 19	2417	33 33 29	2416
	Spica	W.	23 10 0	2477	24 51 46	2456	26 34 9	2429	28 17 2	2412
	Sun	E.	63 31 41	2595	61 52 39	2594	60 13 36	2594	58 34 33	2593
9	Mars	W.	42 9 44	2413	43 53 0	2414	45 36 15	2415	47 19 29	2416
	Spica	W.	36 56 28	2360	38 41 0	2355	40 25 39	2351	42 10 24	2348
	Sun	E.	50 19 19	2597	48 40 20	2599	47 1 23	2600	45 22 28	2602
10	Mars	W.	55 54 59	2428	57 37 54	2431	59 20 44	2436	61 3 28	2440
	Spica	W.	50 54 55	2344	52 39 50	2346	54 24 43	2348	56 9 33	2350
	Sun	E.	37 8 48	2618	35 30 18	2624	33 51 55	2628	32 13 38	2633
14	Sun	W.	14 7 3	2946	15 38 23	2957	17 9 30	2968	18 40 23	2980
	α Arietis	E.	88 9 35	2732	86 33 38	2746	84 57 59	2760	83 22 39	2775
	Aldebaran	E.	120 9 16	2577	118 29 50	2591	116 50 42	2604	115 11 53	2618
15	Sun	W.	26 10 45	3048	27 39 58	3063	29 8 53	3077	30 37 31	3091
	α Arietis	E.	75 30 55	2853	73 57 36	2869	72 24 38	2887	70 52 2	2903
	Aldebaran	E.	107 2 23	2687	105 25 25	2700	103 48 45	2714	102 12 24	2728
16	Sun	W.	37 56 16	3163	39 23 9	3178	40 49 45	3192	42 16 4	3205
	α Arietis	E.	63 14 37	2995	61 44 18	3014	60 14 22	3034	58 44 51	3054
	Aldebaran	E.	94 15 11	2796	92 40 38	2809	91 6 22	2822	89 32 23	2835
17	Sun	W.	49 23 37	3272	50 48 21	3285	52 12 50	3297	53 37 5	3308
	α Arietis	E.	51 23 39	3163	49 56 45	3187	48 30 20	3212	47 4 25	3237
	Aldebaran	E.	81 46 35	2897	80 14 12	2909	78 42 4	2920	77 10 11	2931
18	Sun	W.	60 35 3	3363	61 58 2	3372	63 20 50	3382	64 43 27	3391
	α Arietis	E.	40 2 56	3389	38 40 27	3426	37 18 40	3467	35 57 39	3510
	Aldebaran	E.	69 34 5	2981	68 3 29	2990	66 33 4	2999	65 2 50	3007
19	Sun	W.	71 34 12	3428	72 55 57	3434	74 17 35	3439	75 39 7	3445
	Fomalhaut	W.	40 31 6	3652	41 48 44	3623	43 6 54	3597	44 25 32	3574
	Aldebaran	E.	57 34 1	3041	56 4 39	3047	54 35 24	3052	53 6 16	3058
20	Sun	W.	82 25 32	3463	83 46 38	3463	85 7 43	3464	86 28 47	3465
	Fomalhaut	W.	51 4 24	3483	52 25 7	3469	53 46 6	3455	55 7 20	3442
	α Pegasi	W.	38 38 19	4106	39 48 15	4045	40 59 10	3990	42 10 59	3941
	Aldebaran	E.	45 41 52	3073	44 13 9	3074	42 44 28	3076	41 15 49	3078
21	Sun	W.	93 14 4	3462	94 35 11	3459	95 56 21	3455	97 17 35	3451
	Fomalhaut	W.	61 56 55	3386	63 19 28	3376	64 42 12	3365	66 5 8	3355
	α Pegasi	W.	48 21 26	3744	49 37 27	3712	50 54 1	3682	52 11 7	3655
	Aldebaran	E.	33 52 38	3073	32 23 56	3071	30 55 11	3069	29 26 23	3065
	Pollux	E.	78 14 33	3119	76 46 46	3118	75 18 58	3116	73 51 8	3114
	Saturn	E.	89 6 45	3043	87 37 25	3040	86 8 2	3038	84 38 36	3034
22	Sun	W.	104 5 0	3425	105 26 48	3419	106 48 43	3411	108 10 47	3403
	Fomalhaut	W.	73 2 42	3306	74 26 47	3295	75 51 4	3285	77 15 33	3276
	α Pegasi	W.	58 43 30	3536	60 3 14	3515	61 23 21	3495	62 43 51	3476

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^h.	P. L. of Diff.	XVIII^h.	P. L. of Diff.	XXI^h.	P. L. of Diff.
8	Regulus	W.	83° 9′ 4″	2270	84° 55′ 48″	2270	86° 42′ 31″	2271	88° 29′ 13″	2272
	Mars	W.	35 16 41	2415	36 59 55	2413	38 43 11	2413	40 26 27	2412
	Spica	W.	30 0 20	2397	31 43 59	2385	33 27 55	2375	35 12 6	2367
	Sun	E.	56 55 29	2593	55 16 25	2594	53 37 22	2595	51 58 20	2596
9	Mars	W.	49 2 41	2418	50 45 50	2420	52 28 56	2422	54 11 59	2424
	Spica	W.	43 55 14	2346	45 40 7	2344	47 25 3	2344	49 9 59	2344
	Sun	E.	43 43 36	2605	42 4 48	2607	40 26 3	2611	38 47 23	2615
10	Mars	W.	62 46 6	2445	64 28 37	2450	66 11 1	2455	67 53 18	2461
	Spica	W.	57 54 20	2353	59 39 2	2357	61 23 39	2361	63 8 10	2365
	Sun	E.	30 35 28	2639	28 57 26	2646	27 19 33	2652	25 41 49	2659
14	Sun	W.	20 11 1	2993	21 41 23	3006	23 11 28	3021	24 41 15	3034
	α Arietis	E.	81 47 38	2790	80 12 57	2805	78 38 36	2821	77 4 35	2837
	Aldebaran	E.	113 33 22	2631	111 55 9	2645	110 17 15	2659	108 39 40	2672
15	Sun	W.	32 5 51	3106	33 33 53	3120	35 1 38	3134	36 29 6	3149
	α Arietis	E.	69 19 47	2921	67 47 55	2939	66 16 26	2958	64 45 20	2976
	Aldebaran	E.	100 36 21	2741	99 0 36	2756	97 25 10	2769	95 50 2	2782
16	Sun	W.	43 42 7	3220	45 7 53	3233	46 33 23	3246	47 58 38	3259
	α Arietis	E.	57 15 45	3074	55 47 4	3096	54 18 49	3117	52 51 0	3140
	Aldebaran	E.	87 58 41	2848	86 25 15	2861	84 52 6	2873	83 19 13	2885
17	Sun	W.	55 1 7	3320	56 24 55	3332	57 48 30	3342	59 11 53	3353
	α Arietis	E.	45 39 0	3265	44 14 7	3294	42 49 48	3324	41 26 4	3355
	Aldebaran	E.	75 38 32	2942	74 7 6	2952	72 35 53	2962	71 4 53	2972
18	Sun	W.	66 5 54	3400	67 28 11	3408	68 50 19	3415	70 12 19	3421
	α Arietis	E.	34 37 26	3557	33 18 5	3610	31 59 41	3668	30 42 20	3734
	Aldebaran	E.	63 32 46	3015	62 2 52	3022	60 33 7	3029	59 3 30	3035
19	Sun	W.	77 0 33	3449	78 21 54	3453	79 43 11	3457	81 4 23	3460
	Fomalhaut	W.	45 44 35	3552	47 4 2	3533	48 23 50	3515	49 43 58	3498
	Aldebaran	E.	51 37 15	3062	50 8 19	3065	48 39 27	3068	47 10 38	3070
20	Sun	W.	87 49 50	3465	89 10 53	3465	90 31 56	3465	91 52 59	3463
	Fomalhaut	W.	56 28 49	3431	57 50 31	3419	59 12 26	3408	60 34 34	3396
	α Pegasi	W.	43 23 37	3895	44 37 2	3852	45 51 11	3813	47 6 0	3777
	Aldebaran	E.	39 47 12	3078	38 18 35	3077	36 49 57	3076	35 21 18	3075
21	Sun	W.	98 38 54	3447	100 0 17	3443	101 21 45	3438	102 43 19	3431
	Fomalhaut	W.	67 28 16	3345	68 51 35	3335	70 15 6	3325	71 38 48	3315
	α Pegasi	W.	53 28 42	3629	54 46 45	3604	56 5 15	3581	57 24 10	3558
	Aldebaran	E.	27 57 31	3061	26 28 34	3058	24 59 33	3053	23 30 26	3048
	Pollux	E.	72 23 15	3110	70 55 18	3106	69 27 16	3103	67 59 10	3099
	Saturn	E.	83 9 6	3030	81 39 31	3026	80 9 51	3022	78 40 5	3016
22	Sun	W.	109 33 0	3395	110 55 22	3386	112 17 54	3378	113 40 36	3367
	Fomalhaut	W.	78 40 13	3265	80 5 5	3254	81 30 10	3244	82 55 27	3234
	α Pegasi	W.	64 4 42	3457	65 25 54	3438	66 47 27	3420	68 9 21	3402

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	III^h.	P. L. of Diff.	VI^h.	P. L. of Diff.	IX^h.	P. L. of Diff.
22	Pollux	E.	66° 30′ 59″	3095	65° 2′ 43″	3090	63° 34′ 21″	3084	62° 5′ 52″	3079
	SATURN	E.	77 10 12	3010	75 40 12	3005	74 10 5	2998	72 39 50	2991
23	SUN	W.	115 3 30	3357	116 26 36	3347	117 49 53	3337	119 13 22	3325
	α Pegasi	W.	69 31 35	3386	70 54 8	3368	72 17 1	3351	73 40 13	3335
	α Arietis	W.	26 34 58	3849	27 49 10	3756	29 4 58	3675	30 22 12	3602
	Pollux	E.	54 41 42	3048	53 12 29	3041	51 43 7	3034	50 13 36	3027
	SATURN	E.	65 6 11	2950	63 34 55	2940	62 3 27	2930	60 31 46	2920
	Regulus	E.	90 10 24	2979	88 39 45	2969	87 8 54	2959	85 37 50	2948
24	α Arietis	W.	37 5 47	3332	38 29 21	3291	39 53 43	3253	41 18 50	3217
	Pollux	E.	42 43 56	2994	41 13 36	2989	39 43 9	2984	38 12 36	2979
	SATURN	E.	52 49 58	2864	51 16 53	2852	49 43 32	2839	48 9 55	2827
	Regulus	E.	77 59 4	2892	76 26 35	2880	74 53 51	2867	73 20 50	2855
25	α Arietis	W.	48 34 19	3065	50 3 12	3038	51 32 38	3013	53 2 35	2988
	SATURN	E.	40 17 40	2761	38 42 21	2747	37 6 43	2733	35 30 47	2719
	Regulus	E.	65 31 34	2788	63 56 50	2774	62 21 48	2760	60 46 27	2746
26	α Arietis	W.	60 39 44	2876	62 12 33	2856	63 45 48	2836	65 19 29	2817
	Aldebaran	W.	27 25 38	2675	29 2 51	2660	30 40 24	2646	32 18 17	2631
	Regulus	E.	52 45 3	2675	51 7 49	2660	49 30 15	2646	47 52 22	2632
27	Aldebaran	W.	40 32 37	2560	42 12 27	2546	43 52 36	2533	45 33 4	2520
	Regulus	E.	39 38 9	2561	37 58 21	2548	36 18 14	2535	34 37 49	2522
	Spica	E.	93 30 7	2593	91 51 2	2579	90 11 38	2565	88 31 55	2551
	MARS	E.	94 40 27	2675	93 3 13	2660	91 25 39	2646	89 47 46	2632
28	Aldebaran	W.	53 59 58	2455	55 42 14	2443	57 24 47	2431	59 7 37	2420
	Spica	E.	80 8 49	2489	78 27 20	2477	76 45 35	2467	75 3 35	2456
	MARS	E.	81 33 44	2566	79 54 2	2553	78 14 2	2540	76 33 45	2529
29	Aldebaran	W.	67 45 41	2368	69 30 2	2359	71 14 36	2349	72 59 24	2341
	Pollux	W.	24 50 52	2622	26 29 17	2583	28 8 35	2551	29 48 38	2522
	Spica	E.	66 29 55	2408	64 46 31	2400	63 2 56	2392	61 19 10	2384
	MARS	E.	68 8 24	2475	66 26 35	2465	64 44 33	2456	63 2 18	2447
	JUPITER	E.	106 29 14	2424	104 46 13	2414	103 2 58	2405	101 19 30	2396
30	Aldebaran	W.	81 46 19	2303	83 32 14	2297	85 18 18	2291	87 4 30	2285
	Pollux	W.	38 17 35	2419	40 0 43	2405	41 44 11	2391	43 27 58	2379
	SATURN	W.	27 16 57	2282	29 3 23	2276	30 49 58	2269	32 36 43	2263
	Spica	E.	52 37 57	2357	50 53 20	2353	49 8 38	2351	47 23 53	2349
	MARS	E.	54 28 2	2408	52 44 39	2402	51 1 7	2396	49 17 27	2391
	JUPITER	E.	92 39 7	2357	90 54 30	2350	89 9 44	2344	87 24 49	2339
	Antares	E.	98 31 53	2360	96 47 21	2353	95 2 39	2347	93 17 48	2341
31	Pollux	W.	52 10 42	2335	53 55 51	2328	55 41 9	2322	57 26 36	2317
	SATURN	W.	41 32 24	2241	43 19 50	2237	45 7 22	2234	46 54 59	2231
	Spica	E.	38 39 48	2353	36 55 5	2357	35 10 29	2364	33 26 2	2372
	MARS	E.	40 37 20	2370	38 53 2	2367	37 8 40	2365	35 24 15	2364
	JUPITER	E.	78 38 22	2316	76 52 46	2313	75 7 6	2311	73 21 22	2308
	Antares	E.	84 31 41	2320	82 46 11	2317	81 0 37	2315	79 14 59	2313

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^h.	P. L. of Diff.	XVIII^h.	P. L. of Diff.	XXI^h.	P. L. of Diff.
22	Pollux	E.	60° 37′ 17″	3073	59° 8′ 35″	3067	57° 39′ 45″	3060	56° 10′ 47″	3055
	Saturn	E.	71 9 26	2984	69 38 53	2976	68 8 10	2967	66 37 16	2958
23	Sun	W.	120 37 4	3313	122 1 0	3301	123 25 10	3288	124 49 35	3276
	α Pegasi	W.	75 3 44	3319	76 27 34	3303	77 51 42	3288	79 16 8	3272
	α Arietis	W.	31 40 44	3536	33 0 28	3479	34 21 16	3425	35 43 4	3377
	Pollux	E.	48 43 57	3021	47 14 10	3014	45 44 14	3006	44 14 9	3000
	Saturn	E.	58 59 52	2909	57 27 45	2898	55 55 24	2887	54 22 48	2876
	Regulus	E.	84 6 32	2938	82 35 1	2927	81 3 17	2916	79 31 18	2904
24	α Arietis	W.	42 44 39	3183	44 11 8	3151	45 38 16	3121	47 6 0	3092
	Pollux	E.	36 41 57	2976	35 11 14	2973	33 40 28	2972	32 9 40	2973
	Saturn	E.	46 36 2	2814	45 1 52	2801	43 27 25	2788	41 52 41	2775
	Regulus	E.	71 47 33	2842	70 13 59	2828	68 40 8	2815	67 6 0	2801
25	α Arietis	W.	54 33 3	2964	56 4 1	2942	57 35 27	2919	59 7 22	2898
	Saturn	E.	33 54 33	2706	32 18 1	2692	30 41 10	2678	29 4 0	2663
	Regulus	E.	59 10 48	2732	57 34 50	2718	55 58 34	2703	54 21 58	2689
26	α Arietis	W.	66 53 35	2798	68 28 5	2779	70 3 0	2762	71 38 18	2744
	Aldebaran	W.	33 56 30	2616	35 35 3	2602	37 13 55	2588	38 53 6	2574
	Regulus	E.	46 14 10	2618	44 35 39	2603	42 56 48	2589	41 17 38	2575
27	Aldebaran	W.	47 13 50	2506	48 54 55	2493	50 36 18	2480	52 17 59	2467
	Regulus	E.	32 57 6	2509	31 16 5	2496	29 34 46	2484	27 53 10	2472
	Spica	E.	86 51 53	2538	85 11 33	2526	83 30 56	2513	81 50 1	2501
	Mars	E.	88 9 35	2618	86 31 5	2604	84 52 16	2591	83 13 9	2578
28	Aldebaran	W.	60 50 43	2409	62 34 5	2398	64 17 42	2388	66 1 34	2378
	Spica	E.	73 21 20	2445	71 38 50	2436	69 56 6	2425	68 13 7	2416
	Mars	E.	74 53 12	2517	73 12 23	2507	71 31 19	2495	69 49 59	2485
29	Aldebaran	W.	74 44 24	2333	76 29 36	2324	78 15 0	2317	80 0 34	2310
	Pollux	W.	31 29 21	2496	33 10 40	2473	34 52 31	2453	36 34 50	2435
	Spica	E.	59 35 13	2378	57 51 6	2372	56 6 51	2366	54 22 28	2361
	Mars	E.	61 19 50	2438	59 37 10	2430	57 54 18	2422	56 11 15	2415
	Jupiter	E.	99 35 49	2387	97 51 55	2379	96 7 50	2371	94 23 34	2364
30	Aldebaran	W.	88 56 51	2280	90 37 20	2275	92 23 56	2271	94 10 38	2268
	Pollux	W.	45 12 3	2368	46 56 23	2359	48 40 57	2350	50 25 44	2342
	Saturn	W.	34 23 37	2258	36 10 39	2253	37 57 48	2249	39 45 3	2245
	Spica	E.	45 39 5	2348	43 54 15	2347	42 9 24	2348	40 24 35	2350
	Mars	E.	47 33 39	2385	45 49 43	2381	44 5 41	2377	42 21 33	2373
	Jupiter	E.	85 39 46	2334	83 54 36	2328	82 9 18	2324	80 23 53	2320
	Antares	E.	91 32 48	2336	89 47 41	2331	88 2 27	2327	86 17 7	2323
31	Pollux	W.	59 12 10	2313	60 57 50	2309	62 43 36	2306	64 29 27	2303
	Saturn	W.	48 42 40	2229	50 30 24	2228	52 18 10	2227	54 5 58	2225
	Spica	E.	31 41 47	2382	29 57 47	2395	28 14 5	2411	26 30 46	2432
	Mars	E.	33 39 48	2362	31 55 19	2362	30 10 50	2362	28 26 21	2364
	Jupiter	E.	71 35 34	2306	69 49 43	2304	68 3 50	2303	66 17 55	2302
	Antares	E.	77 29 18	2311	75 43 35	2311	73 57 51	2311	72 12 7	2311

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.	Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Added to Apparent Time.	Diff. for 1 Hour.
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Wed.	1	20 58 22.73	10.194	S. 17 10 0.3	+42.51	16 16.09	68.31	13 47.76	0.337
Thur.	2	21 2 26.98	10.161	16 52 50.8	43.26	16 15.94	68.19	13 55.44	0.304
Frid.	3	21 6 30.42	10.127	16 35 23.6	43.99	16 15.78	68.08	14 2.32	0.270
Sat.	4	21 10 33.07	10.093	16 17 39.1	+44.71	16 15.62	67.96	14 8.39	0.237
SUN.	5	21 14 34.92	10.060	15 59 37.6	45.41	16 15 45	67.84	14 13.67	0.204
Mon.	6	21 18 35.97	10.027	15 41 19.6	46.09	16 15.28	67.72	14 18.15	0.171
Tues.	7	21 22 36.23	9.994	15 22 45 5	+46.75	16 15.10	67.60	14 21.84	0.138
Wed.	8	21 26 35.70	9.962	15 3 55.7	47.40	16 14.92	67.49	14 24.75	0.106
Thur.	9	21 30 34.39	9.929	14 44 50.7	48.03	16 14.74	67.38	14 26.88	0.073
Frid.	10	21 34 32.30	9.897	14 25 30.8	+48.64	16 14.55	67.27	14 28.23	0.041
Sat.	11	21 38 29.43	9.865	14 5 56.4	49.23	16 14.36	67.16	14 28.81	0.009
SUN.	12	21 42 25.79	9.833	13 46 8.1	49.80	16 14.17	67.05	14 28.62	0.023
Mon.	13	21 46 21.39	9.801	13 26 6.3	+50.36	16 13.98	66.94	14 27.66	0.055
Tues.	14	21 50 16.22	9.770	13 5 51.3	50.90	16 13.78	66.83	14 25.94	0.086
Wed.	15	21 54 10.30	9.738	12 45 23.5	51.41	16 13.58	66.72	14 23.48	0.117
Thur.	16	21 58 3.63	9.707	12 24 43.5	+51.91	16 13.38	66.62	14 20.27	0.148
Frid.	17	22 1 56.23	9.676	12 3 51.6	52.39	16 13.18	66.52	14 16.32	0.179
Sat.	18	22 5 48.10	9.646	11 42 48.4	52.86	16 12.98	66.42	14 11.65	0.209
SUN.	19	22 9 39.26	9.617	11 21 34.2	+53.31	16 12.77	66.32	14 6.27	0.238
Mon.	20	22 13 29.72	9.588	11 0 9.4	53.74	16 12.56	66.23	14 0.19	0.267
Tues.	21	22 17 19.50	9.560	10 38 34.5	54.16	16 12.35	66.13	13 53.44	0.295
Wed.	22	22 21 8.61	9.533	10 16 49.8	+54.56	16 12.13	66.04	13 46.02	0.322
Thur.	23	22 24 57.07	9.507	9 54 55.7	54.94	16 11.91	65.95	13 37.95	0.348
Frid.	24	22 28 44.89	9.481	9 32 52.7	55.31	16 11.68	65.86	13 29.25	0.374
Sat.	25	22 32 32.11	9.456	9 10 41.1	+55.66	16 11.45	65.77	13 19.94	0.399
SUN.	26	22 36 18.74	9.431	8 48 21.5	55.99	16 11.22	65.69	13 10.04	0 424
Mon.	27	22 40 4.80	9.408	8 25 54.1	56.30	16 10.98	65.61	12 59.58	0.447
Tues.	28	22 43 50.30	9.386	8 3 19.2	56.60	16 10.74	65.53	12 48.57	0.469
Wed.	29	22 47 35.28	9.365	7 40 37.3	56.89	16 10.50	65.45	12 37.03	0.490
Thur.	30	22 51 19.75	9.344	S. 7 17 48.8	+57.15	16 10.25	65.38	12 24.98	0.511

NOTE.—The mean time of semidiameter passing may be found by subtracting 0ˢ.18 from the sidereal time.
The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	Diff. for 1 Hour.	THE SUN'S Apparent Declination.	Diff. for 1 Hour.	Equation of Time, to be Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	s	m s	s	h m s
Wed.	1	20 58 20.38	10.193	S. 17 10 10.0	+42.50	13 47.69	0.337	20 44 32.69
Thur.	2	21 2 24.62	10.160	16 53 0.8	43.25	13 55.37	0.304	20 48 29.25
Frid.	3	21 6 28.05	10.126	16 35 33.9	43.98	14 2.25	0.270	20 52 25.80
Sat.	4	21 10 30.69	10.093	16 17 49.6	+44.70	14 8.33	0.237	20 56 22.36
SUN.	5	21 14 32.53	10.060	15 59 48.4	45.40	14 13.62	0.204	21 0 18.91
Mon.	6	21 18 33.58	10.027	15 41 30.6	46.08	14 18.11	0.171	21 4 15.47
Tues.	7	21 22 33.84	9.994	15 22 56.7	+46.74	14 21.81	0.138	21 8 12.02
Wed.	8	21 26 33.31	9.962	15 4 7.1	47.39	14 24.73	0.106	21 12 8.58
Thur.	9	21 30 32.00	9.929	14 45 2.2	48.02	14 26.87	0.073	21 16 5.13
Frid.	10	21 34 29.91	9.897	14 25 42.5	+48.63	14 28.22	0.041	21 20 1.69
Sat.	11	21 38 27.04	9.865	14 6 8.3	49.22	14 28.80	0.009	21 23 58.24
SUN.	12	21 42 23.41	9.833	13 46 20.1	49.79	14 28.62	0.023	21 27 54.79
Mon.	13	21 46 19.02	9.801	13 26 18.4	+50.35	14 27.67	0.055	21 31 51.34
Tues.	14	21 50 13.86	9.770	13 6 3.5	50.89	14 25.96	0.086	21 35 47.90
Wed.	15	21 54 7.95	9.739	12 45 35.8	51.41	14 23.50	0.117	21 39 44.45
Thur.	16	21 58 1.30	9.708	12 24 55.9	+51.91	14 20.30	0.148	21 43 41.01
Frid.	17	22 1 53.92	9.677	12 4 4.1	52.39	14 16.36	0.179	21 47 37.56
Sat.	18	22 5 45.81	9.647	11 43 0.9	52.86	14 11.69	0.209	21 51 34.12
SUN.	19	22 9 36.99	9.618	11 21 46.7	+53.31	14 6 32	0.238	21 55 30.67
Mon.	20	22 13 27.48	9.589	11 0 21.9	53.74	14 0.25	0.267	21 59 27.23
Tues.	21	22 17 17.28	9.561	10 38 47.0	54.16	13 53.50	0.295	22 3 23.78
Wed.	22	22 21 6.42	9.534	10 17 2.3	+54.56	13 46.09	0.322	22 7 20.33
Thur.	23	22 24 54.90	9.508	9 55 8.2	54.95	13 38.02	0.348	22 11 16.88
Frid.	24	22 28 42.76	9.482	9 33 5.1	55.31	13 29.33	0.374	22 15 13.43
Sat.	25	22 32 30.01	9.457	9 10 53.5	+55.66	13 20.03	0.399	22 19 9.98
SUN.	26	22 36 16.67	9.432	8 48 33.8	55.99	13 10.13	0.424	22 23 6.54
Mon.	27	22 40 2.76	9.409	8 26 6.3	56.30	12 59.67	0.447	22 27 3.09
Tues.	28	22 43 48.30	9.387	8 3 31.3	56.60	12 48.66	0.469	22 30 59.64
Wed.	29	22 47 33.31	9.366	7 40 49.3	56.89	12 37.12	0.490	22 34 56.19
Thur.	30	22 51 17.82	9.345	S. 7 18 0.7	+57.16	12 25.07	0.511	22 38 52.75

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing.

Diff. for 1 Hour, + 9s.8565. (Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S TRUE LONGITUDE. λ	THE SUN'S TRUE LONGITUDE. λ'	Diff. for 1 Hour.	THE SUN'S LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		° ′ ″	′ ″	″	″			h m s
1	32	312 7 31.9	7 39.9	152.14	+ 0.61	9.9936820	+28.3	3 14 55.28
2	33	313 8 23.0	8 30.8	152.11	0.69	9.9937512	29.3	3 10 59.38
3	34	314 9 13.2	9 20.9	152.07	0.72	9.9938225	30.2	3 7 3.47
4	35	315 10 2.5	10 10.1	152.04	+ 0.73	9.9938959	+31.0	3 3 7.56
5	36	316 10 50.9	10 58.4	152.00	0.71	9.9939712	31.7	2 59 11.65
6	37	317 11 38.4	11 45.7	151.96	0.66	9.9940482	32.4	2 55 15.74
7	38	318 12 24.8	12 32.0	151.92	+ 0.59	9.9941268	+33.1	2 51 19.83
8	39	319 13 10.2	13 17.3	151.87	0.48	9.9942069	33.7	2 47 23.92
9	40	320 13 54.5	14 1.5	151.82	0.36	9.9942884	34.2	2 43 28.01
10	41	321 14 37.6	14 44.5	151.77	+ 0.23	9.9943711	+34.7	2 39 32.11
11	42	322 15 19.4	15 26.2	151.72	+ 0.09	9.9944548	35.2	2 35 36.20
12	43	323 15 59.9	16 6.5	151.66	− 0.05	9.9945396	35.6	2 31 40.29
13	44	324 16 39.0	16 45.5	151.60	− 0.18	9.9946255	+36.1	2 27 44.38
14	45	325 17 16.6	17 23.0	151.53	0.30	9.9947125	36.5	2 23 48.48
15	46	326 17 52.5	17 58.8	151.46	0.40	9.9948005	37.0	2 19 52.57
16	47	327 18 26.6	18 32.8	151.38	− 0.47	9.9948895	+37.4	2 15 56.66
17	48	328 18 59.0	19 5.1	151.31	0.50	9.9949796	37.9	2 12 0.75
18	49	329 19 29.5	19 35.5	151.23	0.51	9.9950709	38.3	2 8 4.84
19	50	330 19 58.2	20 4.1	151.15	− 0.50	9.9951635	+38.9	2 4 8.93
20	51	331 20 25.0	20 30.8	151.07	0.45	9.9952576	39.5	2 0 13.02
21	52	332 20 49.9	20 55.6	150.99	0.37	9.9953531	40.1	1 56 17.11
22	53	333 21 12.8	21 18.4	150.91	− 0.28	9.9954502	+40.8	1 52 21.21
23	54	334 21 33.8	21 39.3	150.83	0.16	9.9955490	41.5	1 48 25.30
24	55	335 21 52 9	21 58.3	150.75	− 0.04	9.9956496	42.3	1 44 29.39
25	56	336 22 10.2	22 15.5	150.68	+ 0.10	9.9957520	+43.0	1 40 33.48
26	57	337 22 25.6	22 30.8	150.60	0.22	9.9958562	43.8	1 36 37.58
27	58	338 22 39.2	22 44.3	150.53	0.33	9.9959622	44.5	1 32 41.67
28	59	339 22 51.1	22 56.1	150.46	0.43	9.9960699	45.2	1 28 45.76
29	60	340 23 1.3	23 6.2	150.39	0.51	9.9961793	45.9	1 24 49.86
30	61	341 23 9.9	23 14.7	150.32	+ 0.55	9.9962904	+46.5	1 20 53.96

NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ', to the mean equinox of January 0d.0.

Diff. for 1 Hour, − 9s.8296. (Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER. Noon.	SEMIDIAMETER. Midnight.	HORIZONTAL PARALLAX. Noon.	Diff. for 1 Hour.	HORIZONTAL PARALLAX. Midnight.	Diff. for 1 Hour.	UPPER TRANSIT. Meridian of Greenwich.	Diff. for 1 Hour.	AGE. Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	16 13.8	16 14.4	59 27.3	+0.25	59 29.2	+0.08	15 48.0	2.14	19.1
2	16 14.3	16 13.8	59 29.1	−0.08	59 27.3	−0.22	16 39.4	2.15	20.1
3	16 12.9	16 11.5	59 23.8	0.35	59 18.9	0.45	17 31.3	2.18	21.1
4	16 9.9	16 8.0	59 12.9	−0.55	59 5.7	−0.64	18 24.1	2.23	22.1
5	16 5.7	16 3.3	58 57.6	0.71	58 48.7	0.78	19 18.4	2.29	23.1
6	16 0.7	15 57.9	58 39.0	0.83	58 28.7	0.89	20 13.9	2.33	24.1
7	15 54.9	15 51.7	58 17.6	−0.95	58 5.9	−1.00	21 10.0	2.34	25.1
8	15 48.3	15 44.7	57 53.5	1.06	57 40.4	1.12	22 5.8	2.30	26.1
9	15 41.0	15 37.1	57 26.7	1.17	57 12.4	1.21	23 0.0	2.21	27.1
10	15 33.1	15 28.9	56 57.6	−1.25	56 42.4	−1.28	23 51.9	2.11	28.1
11	15 24.7	15 20.4	56 26.8	1.30	56 11.1	1.31	♂		29.1
12	15 16.2	15 11.9	55 55.5	1.30	55 40.0	1.27	0 41.2	1.99	0.5
13	15 7.9	15 4.0	55 25.1	−1.22	55 10.8	−1.16	1 27.8	1.89	1.5
14	15 0.3	14 57.0	54 57.4	1.07	54 45.2	0.96	2 12.3	1.81	2.5
15	14 54.1	14 51.6	54 34.4	0.83	54 25.3	0.68	2 55.3	1.77	3.5
16	14 49.6	14 48.2	54 18.0	−0.53	54 12.7	−0.35	3 37.4	1.75	4.5
17	14 47.4	14 47.2	54 9.7	−0.16	54 9.0	+0.05	4 19.4	1.76	5.5
18	14 47.7	14 48.9	54 10.8	+0.26	54 15.2	0.47	5 2.2	1.81	6.5
19	14 50.7	14 53.3	54 22.1	+0.69	54 31.7	+0.91	5 46.4	1.88	7.5
20	14 56.7	15 0.7	54 43.9	1.12	54 58.6	1.33	6 32.6	1.97	8.5
21	15 5.3	15 10.6	55 15.7	1.52	55 35.0	1.69	7 21.1	2.08	9.5
22	15 16.4	15 22.7	55 56.3	+1.85	56 19.4	+1.98	8 12.2	2.18	10.5
23	15 29.3	15 36.2	56 43.8	2.07	57 9.1	2.13	9 5 4	2.25	11.5
24	15 43.2	15 50.3	57 34.9	2.15	58 0.7	2.12	10 0.0	2.29	12.5
25	15 57.1	16 3.6	58 25.8	+2.05	58 49.8	+1.93	10 55.2	2.30	13.5
26	16 9.7	16 15.1	59 12.0	1.76	59 31.9	1.55	11 50.3	2.28	14.5
27	16 19.8	16 23.6	59 49.1	1.30	60 3.1	1.02	12 44.7	2.25	15.5
28	16 26.4	16 28.3	60 13.6	0.73	60 20.5	+0.42	13 38.4	2.22	16.5
29	16 29.2	16 29.1	60 23.7	+0.11	60 23.2	−0.18	14 31.8	2.22	17.5
30	16 28.0	16 26.1	60 19.3	−0.45	60 12.3	−0.70	15 25.3	2.24	18.5

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	11 59 43.86	2.2466	N. 4 21 3.7	12.239
1	12 1 58.62	2.2455	4 8 48.6	12.263
2	12 4 13.32	2.2445	3 56 32.1	12.287
3	12 6 27.96	2.2435	3 44 14.1	12.311
4	12 8 42.54	2.2426	3 31 54.8	12.332
5	12 10 57.07	2.2417	3 19 34.3	12.351
6	12 13 11.54	2.2408	3 7 12.7	12.369
7	12 15 25.96	2.2399	2 54 50.0	12.387
8	12 17 40.33	2.2392	2 42 26.2	12.404
9	12 19 54.66	2.2384	2 30 1.5	12.418
10	12 22 8.94	2.2377	2 17 36.0	12.432
11	12 24 23.18	2.2370	2 5 9.7	12.444
12	12 26 37.38	2.2364	1 52 42.7	12.455
13	12 28 51.55	2.2358	1 40 15.1	12.465
14	12 31 5.68	2.2352	1 27 46.9	12.473
15	12 33 19.78	2.2347	1 15 18.3	12.480
16	12 35 33.85	2.2343	1 2 49.3	12.486
17	12 37 47.90	2.2339	0 50 20.0	12.491
18	12 40 1.92	2.2335	0 37 50.4	12.495
19	12 42 15.92	2.2332	0 25 20.6	12.497
20	12 44 29.90	2.2329	0 12 50.8	12.497
21	12 46 43.87	2.2327	N. 0 0 21.0	12.496
22	12 48 57.82	2.2325	S. 0 12 8.7	12.494
23	12 51 11.77	2.2324	S. 0 24 38.3	12.492

THURSDAY 2.

0	12 53 25.71	2.2323	S. 0 37 7.7	12.488
1	12 55 39.64	2.2322	0 49 36.8	12.482
2	12 57 53.57	2.2322	1 2 5.5	12.475
3	13 0 7.50	2.2323	1 14 33.8	12.467
4	13 2 21.44	2.2323	1 27 1.5	12.457
5	13 4 35.38	2.2324	1 39 28.6	12.447
6	13 6 49.33	2.2326	1 51 55.1	12.435
7	13 9 3.29	2.2328	2 4 20.8	12.422
8	13 11 17.27	2.2331	2 16 45.7	12.407
9	13 13 31.26	2.2334	2 29 9.7	12.392
10	13 15 45.27	2.2337	2 41 32.7	12.375
11	13 17 59.30	2.2341	2 53 54.7	12.357
12	13 20 13.36	2.2346	3 6 15.6	12.338
13	13 22 27.45	2.2351	3 18 35.3	12.317
14	13 24 41.57	2.2356	3 30 53.7	12.295
15	13 26 55.72	2.2361	3 43 10.7	12.272
16	13 29 9.90	2.2367	3 55 26.3	12.248
17	13 31 24.12	2.2374	4 7 40.5	12.223
18	13 33 38.38	2.2381	4 19 53.1	12.196
19	13 35 52.69	2.2388	4 32 4.0	12.168
20	13 38 7.04	2.2396	4 44 13.2	12.139
21	13 40 21.44	2.2405	4 56 20.7	12.110
22	13 42 35.90	2.2414	5 8 26.4	12.078
23	13 44 50.41	2.2423	5 20 30.1	12.044
24	13 47 4.97	2.2432	S. 5 32 31.7	12.009

FRIDAY 3.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	13 47 4.97	2.2432	S. 5 32 31.7	12.009
1	13 49 19.59	2.2442	5 44 31.2	11.975
2	13 51 34.27	2.2452	5 56 28.7	11.940
3	13 53 49.02	2.2463	6 8 24.0	11.902
4	13 56 3.83	2.2474	6 20 17.0	11.863
5	13 58 18.71	2.2486	6 32 7.6	11.823
6	14 0 33.67	2.2499	6 43 55.8	11.782
7	14 2 48.70	2.2511	6 55 41.5	11.740
8	14 5 3.80	2.2523	7 7 24.6	11.697
9	14 7 18.98	2.2537	7 19 5.1	11.652
10	14 9 34.24	2.2551	7 30 42.9	11.606
11	14 11 49.59	2.2565	7 42 17.8	11.559
12	14 14 5.02	2.2579	7 53 49.9	11.511
13	14 16 20.54	2.2594	8 5 19.1	11.462
14	14 18 36.15	2.2608	8 16 45.3	11.411
15	14 20 51.84	2.2623	8 28 8.4	11.359
16	14 23 7.63	2.2639	8 39 28.4	11.307
17	14 25 23.51	2.2655	8 50 45.2	11.253
18	14 27 39.49	2.2672	9 1 58.8	11.198
19	14 29 55.57	2.2689	9 13 9.0	11.142
20	14 32 11.75	2.2706	9 24 15.8	11.085
21	14 34 28.04	2.2723	9 35 19.2	11.027
22	14 36 44.43	2.2741	9 46 19.0	10.967
23	14 39 0.93	2.2759	S. 9 57 15.2	10.906

SATURDAY 4.

0	14 41 17.54	2.2777	S. 10 8 7.7	10.844
1	14 43 34.25	2.2795	10 18 56.5	10.782
2	14 45 51.08	2.2814	10 29 41.5	10.717
3	14 48 8.02	2.2833	10 40 22.6	10.652
4	14 50 25.08	2.2852	10 50 59.7	10.586
5	14 52 42.25	2.2872	11 1 32.9	10.519
6	14 54 59.54	2.2892	11 12 2.0	10.450
7	14 57 16.95	2.2912	11 22 26.9	10.381
8	14 59 34.48	2.2932	11 32 47.7	10.311
9	15 1 52.13	2.2952	11 43 4.2	10.239
10	15 4 9.90	2.2972	11 53 16.4	10.167
11	15 6 27.80	2.2993	12 3 24.2	10.093
12	15 8 45.82	2.3014	12 13 27.5	10.018
13	15 11 3.97	2.3035	12 23 26.3	9.942
14	15 13 22.24	2.3056	12 33 20.5	9.865
15	15 15 40.64	2.3077	12 43 10.1	9.787
16	15 17 59.17	2.3099	12 52 55.0	9.709
17	15 20 17.83	2.3121	13 2 35.2	9.629
18	15 22 36.62	2.3142	13 12 10.5	9.548
19	15 24 55.54	2.3164	13 21 40.9	9.466
20	15 27 14.59	2.3186	13 31 6.4	9.383
21	15 29 33.77	2.3208	13 40 26.9	9.299
22	15 31 53.08	2.3230	13 49 42.3	9.214
23	15 34 12.53	2.3252	13 58 52.6	9.128
24	15 36 32.11	2.3274	S. 14 7 57.7	9.042

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 5.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	15 36 32.11	2.3274	S. 14 7 57.7	9.042
1	15 38 51.82	2.3296	14 16 57.6	8.954
2	15 41 11.66	2.3318	14 25 52.2	8.865
3	15 43 31.63	2.3340	14 34 41.4	8.775
4	15 45 51.74	2.3362	14 43 25.2	8.684
5	15 48 11.98	2.3384	14 52 3.5	8.592
6	15 50 32.35	2.3406	15 0 36.3	8.500
7	15 52 52.85	2.3428	15 9 3.5	8.407
8	15 55 13.48	2.3450	15 17 25.1	8.312
9	15 57 34.25	2.3472	15 25 41.0	8.217
10	15 59 55.15	2.3493	15 33 51.1	8.121
11	16 2 16.17	2.3514	15 41 55.5	8.024
12	16 4 37.32	2.3536	15 49 54.0	7.926
13	16 6 58.60	2.3557	15 57 46.6	7.827
14	16 9 20.01	2.3579	16 5 33.3	7.727
15	16 11 41.55	2.3600	16 13 13.9	7.627
16	16 14 3.21	2.3621	16 20 48.5	7.526
17	16 16 25.00	2.3642	16 28 17.0	7.424
18	16 18 46.91	2.3662	16 35 39.4	7.322
19	16 21 8.94	2.3682	16 42 55.6	7.218
20	16 23 31.09	2.3702	16 50 5.5	7.113
21	16 25 53.37	2.3722	16 57 9.1	7.007
22	16 28 15.76	2.3742	17 4 6.3	6.901
23	16 30 38.27	2.3761	S. 17 10 57.2	6.795

MONDAY 6.

0	16 33 0.89	2.3779	S. 17 17 41.7	6.687
1	16 35 23.62	2.3798	17 24 19.7	6.579
2	16 37 46.47	2.3817	17 30 51.2	6.470
3	16 40 9.43	2.3835	17 37 16.1	6.360
4	16 42 32.49	2.3852	17 43 34.4	6.249
5	16 44 55.66	2.3870	17 49 46.0	6.138
6	16 47 18.93	2.3887	17 55 51.0	6.026
7	16 49 42.30	2.3903	18 1 49.2	5.914
8	16 52 5.77	2.3920	18 7 40.7	5.802
9	16 54 29.34	2.3936	18 13 25.4	5.688
10	16 56 53.00	2.3951	18 19 3.3	5.574
11	16 59 16.75	2.3966	18 24 34.3	5.459
12	17 1 40.59	2.3981	18 29 58.4	5.344
13	17 4 4.52	2.3995	18 35 15.6	5.228
14	17 6 28.53	2.4008	18 40 25.8	5.111
15	17 8 52.62	2.4021	18 45 29.0	4.994
16	17 11 16.79	2.4034	18 50 25.1	4.877
17	17 13 41.03	2.4047	18 55 14.2	4.759
18	17 16 5.35	2.4058	18 59 56.2	4.641
19	17 18 29.73	2.4069	19 4 31.1	4.522
20	17 20 54.18	2.4080	19 8 58.8	4.402
21	17 23 18.69	2.4090	19 13 19.3	4.282
22	17 25 43.26	2.4099	19 17 32.6	4.162
23	17 28 7.88	2.4108	19 21 38.7	4.042
24	17 30 32.56	2.4117	S. 19 25 37.6	3.921

TUESDAY 7.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	17 30 32.56	2.4117	S. 19 25 37.6	3.921
1	17 32 57.29	2.4125	19 29 29.2	3.799
2	17 35 22.06	2.4132	19 33 13.5	3.677
3	17 37 46.87	2.4138	19 36 50.4	3.554
4	17 40 11.72	2.4144	19 40 20.0	3.432
5	17 42 36.60	2.4150	19 43 42.2	3.309
6	17 45 1.52	2.4156	19 46 57.1	3.186
7	17 47 26.47	2.4159	19 50 4.6	3.063
8	17 49 51.43	2.4162	19 53 4.7	2.940
9	17 52 16.41	2.4165	19 55 57.4	2.816
10	17 54 41.41	2.4167	19 58 42.6	2.692
11	17 57 6.42	2.4169	20 1 20.4	2.567
12	17 59 31.44	2.4170	20 3 50.7	2.442
13	18 1 56.46	2.4170	20 6 13.5	2.318
14	18 4 21.48	2.4170	20 8 28.9	2.194
15	18 6 46.50	2.4169	20 10 36.8	2.069
16	18 9 11.51	2.4167	20 12 37.2	1.944
17	18 11 36.50	2.4164	20 14 30.1	1.819
18	18 14 1.47	2.4160	20 16 15.5	1.694
19	18 16 26.42	2.4156	20 17 53.4	1.569
20	18 18 51.35	2.4152	20 19 23.8	1.444
21	18 21 16.25	2.4147	20 20 46.7	1.319
22	18 23 41.11	2.4141	20 22 2.1	1.193
23	18 26 5.94	2.4135	S. 20 23 9.9	1.067

WEDNESDAY 8.

0	18 28 30.73	2.4127	S. 20 24 10.2	0.942
1	18 30 55.47	2.4118	20 25 3.0	0.817
2	18 33 20.15	2.4109	20 25 48.3	0.693
3	18 35 44.78	2.4100	20 26 26.2	0.569
4	18 38 9.35	2.4089	20 26 56.6	0.444
5	18 40 33.85	2.4078	20 27 19.5	0.319
6	18 42 58.29	2.4067	20 27 34.9	0.195
7	18 45 22.66	2.4055	20 27 42.9	− 0.071
8	18 47 46.95	2.4041	20 27 43.4	+ 0.053
9	18 50 11.15	2.4027	20 27 36.5	0.177
10	18 52 35.27	2.4012	20 27 22.2	0.301
11	18 54 59.30	2.3997	20 27 0.4	0.425
12	18 57 23.23	2.3981	20 26 31.2	0.548
13	18 59 47.07	2.3964	20 25 54.7	0.670
14	19 2 10.80	2.3947	20 25 10.8	0.793
15	19 4 34.43	2.3929	20 24 19.5	0.916
16	19 6 57.95	2.3910	20 23 20.9	1.037
17	19 9 21.35	2.3890	20 22 15.1	1.158
18	19 11 44.63	2.3869	20 21 2.0	1.279
19	19 14 7.78	2.3848	20 19 41.6	1.400
20	19 16 30.81	2.3827	20 18 14.0	1.520
21	19 18 53.71	2.3806	20 16 39.2	1.640
22	19 21 16.48	2.3782	20 14 57.2	1.759
23	19 23 39.10	2.3758	20 13 8.1	1.878
24	19 26 1.58	2.3734	S. 20 11 11.8	1.997

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

THURSDAY 9.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	19 26 1.58	2.3734	S. 20 11 11.8	1.997
1	19 28 23.91	2.3709	20 9 8.4	2.115
2	19 30 46.09	2.3684	20 6 58.0	2.233
3	19 33 8.12	2.3658	20 4 40.5	2.350
4	19 35 29.99	2.3632	20 2 16.0	2.466
5	19 37 51.70	2.3605	19 59 44.6	2.582
6	19 40 13.25	2.3577	19 57 6.2	2.697
7	19 42 34.63	2.3548	19 54 20.9	2.812
8	19 44 55.83	2.3519	19 51 28.7	2.927
9	19 47 16.86	2.3490	19 48 29.7	3.040
10	19 49 37.71	2.3459	19 45 23.9	3.153
11	19 51 58.37	2.3428	19 42 11.4	3.265
12	19 54 18.85	2.3397	19 38 52.1	3.377
13	19 56 39.14	2.3366	19 35 26.1	3.488
14	19 58 59.24	2.3333	19 31 53.5	3.598
15	20 1 19.14	2.3301	19 28 14.3	3.708
16	20 3 38.85	2.3267	19 24 28.5	3.817
17	20 5 58.35	2.3233	19 20 36.2	3.925
18	20 8 17.65	2.3200	19 16 37.5	4.033
19	20 10 36.75	2.3165	19 12 32.3	4.140
20	20 12 55.63	2.3129	19 8 20.7	4.246
21	20 15 14.30	2.3093	19 4 2.8	4.351
22	20 17 32.75	2.3058	18 59 38.6	4.455
23	20 19 50.99	2.3022	S. 18 55 8.2	4.559

FRIDAY 10.

0	20 22 9.01	2.2985	S. 18 50 31.5	4.663
1	20 24 26.81	2.2947	18 45 48.6	4.765
2	20 26 44.38	2.2910	18 40 59.7	4.866
3	20 29 1.73	2.2872	18 36 4.7	4.967
4	20 31 18.85	2.2833	18 31 3.7	5.067
5	20 33 35.73	2.2794	18 25 56.7	5.165
6	20 35 52.38	2.2756	18 20 43.9	5.263
7	20 38 8.80	2.2717	18 15 25.2	5.360
8	20 40 24.98	2.2677	18 10 0.7	5.457
9	20 42 40.92	2.2637	18 4 30.4	5.552
10	20 44 56.62	2.2597	17 58 54.4	5.647
11	20 47 12.08	2.2557	17 53 12.7	5.741
12	20 49 27.30	2.2516	17 47 25.5	5.834
13	20 51 42.27	2.2475	17 41 32.7	5.926
14	20 53 57.00	2.2434	17 35 34.4	6.017
15	20 56 11.48	2.2392	17 29 30.7	6.107
16	20 58 25.71	2.2351	17 23 21.6	6.196
17	21 0 39.69	2.2310	17 17 7.2	6.284
18	21 2 53.43	2.2268	17 10 47.5	6.371
19	21 5 6.91	2.2226	17 4 22.6	6.457
20	21 7 20.14	2.2183	16 57 52.6	6.543
21	21 9 33.11	2.2141	16 51 17.4	6.629
22	21 11 45.83	2.2098	16 44 37.1	6.713
23	21 13 58.29	2.2056	16 37 51.8	6.796
24	21 16 10.50	2.2013	S. 16 31 1.6	6.877

SATURDAY 11.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	21 16 10.50	2.2013	S. 16 31 1.6	6.877
1	21 18 22.45	2.1971	16 24 6.5	6.958
2	21 20 34.15	2.1928	16 17 6.6	7.038
3	21 22 45.59	2.1885	16 10 2.0	7.117
4	21 24 56.77	2.1842	16 2 52.6	7.195
5	21 27 7.69	2.1799	15 55 38.6	7.272
6	21 29 18.36	2.1757	15 48 20.0	7.348
7	21 31 28.77	2.1713	15 40 56.8	7.423
8	21 33 38.92	2.1670	15 33 29.2	7.497
9	21 35 48.81	2.1627	15 25 57.2	7.570
10	21 37 58.44	2.1584	15 18 20.8	7.643
11	21 40 7.81	2.1541	15 10 40.0	7.715
12	21 42 16.93	2.1498	15 2 55.0	7.785
13	21 44 25.79	2.1455	14 55 5.8	7.854
14	21 46 34.39	2.1413	14 47 12.5	7.922
15	21 48 42.74	2.1370	14 39 15.1	7.990
16	21 50 50.83	2.1327	14 31 13.7	8.057
17	21 52 58.66	2.1284	14 23 8.3	8.122
18	21 55 6.24	2.1242	14 14 59.0	8.187
19	21 57 13.56	2.1199	14 6 45.9	8.250
20	21 59 20.63	2.1157	13 58 29.0	8.313
21	22 1 27.45	2.1116	13 50 8.3	8.376
22	22 3 34.02	2.1074	13 41 43.9	8.437
23	22 5 40.33	2.1031	S. 13 33 15.9	8.496

SUNDAY 12.

0	22 7 46.39	2.0989	S. 13 24 44.4	8.554
1	22 9 52.20	2.0948	13 16 9.4	8.612
2	22 11 57.77	2.0907	13 7 30.9	8.669
3	22 14 3.09	2.0866	12 58 49.1	8.725
4	22 16 8.16	2.0825	12 50 3.9	8.781
5	22 18 12.99	2.0784	12 41 15.4	8.835
6	22 20 17.57	2.0743	12 32 23.7	8.888
7	22 22 21.91	2.0703	12 23 28.8	8.941
8	22 24 26.01	2.0663	12 14 30.8	8.992
9	22 26 29.87	2.0623	12 5 29.8	9.042
10	22 28 33.49	2.0584	11 56 25.8	9.091
11	22 30 36.88	2.0545	11 47 18.9	9.140
12	22 32 40.03	2.0506	11 38 9.0	9.188
13	22 34 42.95	2.0467	11 28 56.3	9.235
14	22 36 45.64	2.0428	11 19 40.8	9.281
15	22 38 48.09	2.0389	11 10 22.6	9.325
16	22 40 50.31	2.0352	11 1 1.8	9.368
17	22 42 52.31	2.0315	10 51 38.4	9.411
18	22 44 54.09	2.0277	10 42 12.4	9.454
19	22 46 55.64	2.0240	10 32 43.9	9.496
20	22 48 56.97	2.0203	10 23 12.9	9.536
21	22 50 58.08	2.0167	10 13 39.6	9.575
22	22 52 58.98	2.0131	10 4 3.9	9.614
23	22 54 59.66	2.0095	9 54 25.9	9.652
24	22 57 0.12	2.0059	S. 9 44 45.7	9.689

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

MONDAY 13.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	22 57 0.12	2.0059	S. 9 44 45.7	9.689
1	22 59 0.37	2.0025	9 35 3.3	9.725
2	23 1 0.42	1.9991	9 25 18.7	9.760
3	23 3 0.26	1.9956	9 15 32.1	9.794
4	23 4 59.89	1.9922	9 5 43.5	9.827
5	23 6 59.32	1.9888	8 55 52.9	9.860
6	23 8 58.55	1.9855	8 46 0.3	9.892
7	23 10 57.58	1.9822	8 36 5.9	9.922
8	23 12 56.41	1.9789	8 26 9.7	9.952
9	23 14 55.05	1.9757	8 16 11.7	9.982
10	23 16 53.50	1.9726	8 6 11.9	10.011
11	23 18 51.76	1.9694	7 56 10.4	10.038
12	23 20 49.83	1.9663	7 46 7.3	10.064
13	23 22 47.72	1.9633	7 36 2.7	10.090
14	23 24 45.43	1.9603	7 25 56.5	10.116
15	23 26 42.96	1.9573	7 15 48.8	10.140
16	23 28 40.31	1.9543	7 5 39.7	10.163
17	23 30 37.48	1.9514	6 55 29.2	10.186
18	23 32 34.48	1.9486	6 45 17.4	10.207
19	23 34 31.31	1.9458	6 35 4.3	10.228
20	23 36 27.98	1.9431	6 24 50.0	10.249
21	23 38 24.48	1.9403	6 14 34.4	10.269
22	23 40 20.82	1.9377	6 4 17.7	10.288
23	23 42 17.00	1.9350	S. 5 53 59.9	10.306

TUESDAY 14.

0	23 44 13.02	1.9324	S. 5 43 41.0	10.323
1	23 46 8.89	1.9299	5 33 21.1	10.339
2	23 48 4.61	1.9274	5 23 0.3	10.355
3	23 50 0.18	1.9249	5 12 38.5	10.371
4	23 51 55.60	1.9225	5 2 15.8	10.385
5	23 53 50.88	1.9202	4 51 52.3	10.398
6	23 55 46.02	1.9178	4 41 28.0	10.411
7	23 57 41.02	1.9156	4 31 2.9	10.423
8	23 59 35.89	1.9134	4 20 37.2	10.434
9	0 1 30.63	1.9112	4 10 10.8	10.445
10	0 3 25.24	1.9091	3 59 43.8	10.455
11	0 5 19.72	1.9069	3 49 16.2	10.465
12	0 7 14.07	1.9048	3 38 48.0	10.473
13	0 9 8.30	1.9029	3 28 19.1	10.481
14	0 11 2.42	1.9010	3 17 50.3	10.488
15	0 12 56.42	1.8991	3 7 20.8	10.495
16	0 14 50.31	1.8972	2 56 50.9	10.501
17	0 16 44.09	1.8954	2 46 20.7	10.505
18	0 18 37.76	1.8936	2 35 50.3	10.509
19	0 20 31.32	1.8919	2 25 19.6	10.513
20	0 22 24.79	1.8903	2 14 48.7	10.516
21	0 24 18.16	1.8887	2 4 17.7	10.518
22	0 26 11.44	1.8872	1 53 46.5	10.591
23	0 28 4.62	1.8856	1 43 15.2	10.522
24	0 29 57.71	1.8841	S. 1 32 43.9	10.522

WEDNESDAY 15.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	0 29 57.71	1.8841	S. 1 32 43.9	10.522
1	0 31 50.71	1.8827	1 22 12.6	10.522
2	0 33 43.63	1.8813	1 11 41.3	10.521
3	0 35 36.47	1.8800	1 1 10.1	10.519
4	0 37 29.23	1.8788	0 50 39.0	10.517
5	0 39 21.92	1.8776	0 40 8.1	10.514
6	0 41 14.54	1.8764	0 29 37.3	10.511
7	0 43 7.09	1.8752	0 19 6.8	10.507
8	0 44 59.57	1.8742	S. 0 8 36.5	10.502
9	0 46 51.99	1.8732	N. 0 1 53.5	10.497
10	0 48 44.35	1.8722	0 12 23.1	10.490
11	0 50 36.65	1.8712	0 22 52.3	10.483
12	0 52 28.90	1.8704	0 33 21.1	10.476
13	0 54 21.10	1.8696	0 43 49.4	10.469
14	0 56 13.25	1.8688	0 54 17.3	10.461
15	0 58 5.35	1.8680	1 4 44.7	10.452
16	0 59 57.41	1.8673	1 15 11.5	10.442
17	1 1 49.43	1.8667	1 25 37.7	10.432
18	1 3 41.42	1.8662	1 36 3.3	10.421
19	1 5 33.37	1.8656	1 46 28.2	10.409
20	1 7 25.29	1.8652	1 56 52.4	10.397
21	1 9 17.19	1.8647	2 7 15.9	10.385
22	1 11 9.06	1.8643	2 17 38.6	10.372
23	1 13 0.91	1.8640	N. 2 28 0.5	10.358

THURSDAY 16.

0	1 14 52.74	1.8637	N. 2 38 21.5	10.343
1	1 16 44.56	1.8635	2 48 41.7	10.328
2	1 18 36.36	1.8633	2 59 0.9	10.313
3	1 20 28.15	1.8632	3 9 19.2	10.297
4	1 22 19.94	1.8632	3 19 36.5	10.280
5	1 24 11.73	1.8631	3 29 52.8	10.263
6	1 26 3.51	1.8631	3 40 8.1	10.246
7	1 27 55.30	1.8632	3 50 22.3	10.227
8	1 29 47.09	1.8633	4 0 35.4	10.208
9	1 31 38.89	1.8634	4 10 47.3	10.188
10	1 33 30.70	1.8636	4 20 58.0	10.168
11	1 35 22.53	1.8639	4 31 7.5	10.148
12	1 37 14.37	1.8643	4 41 15.8	10.127
13	1 39 6.24	1.8647	4 51 22.8	10.105
14	1 40 58.13	1.8650	5 1 28.4	10.082
15	1 42 50.04	1.8654	5 11 32.7	10.060
16	1 44 41.98	1.8660	5 21 35.6	10.037
17	1 46 33.96	1.8666	5 31 37.1	10.013
18	1 48 25.97	1.8672	5 41 37.1	9.988
19	1 50 18.02	1.8678	5 51 35.7	9.963
20	1 52 10.11	1.8685	6 1 32.7	9.937
21	1 54 2.24	1.8692	6 11 28.1	9.910
22	1 55 54.42	1.8701	6 21 21.9	9.884
23	1 57 46.65	1.8710	6 31 14.1	9.857
24	1 59 38.94	1.8719	N. 6 41 4.7	9.829

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

FRIDAY 17.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	1 59 38.94	1.8719	N. 6 41 4.7	9.829
1	2 1 31.28	1.8728	6 50 53.6	9.800
2	2 3 23.68	1.8738	7 0 40.7	9.771
3	2 5 16.14	1.8749	7 10 26.1	9.742
4	2 7 8.67	1.8760	7 20 9.7	9.712
5	2 9 1.26	1.8771	7 29 51.5	9.682
6	2 10 53.92	1.8782	7 39 31.5	9.651
7	2 12 46.65	1.8795	7 49 9.6	9.619
8	2 14 39.46	1.8808	7 58 45.7	9.586
9	2 16 32.35	1.8822	8 8 19.9	9.553
10	2 18 25.32	1.8836	8 17 52.1	9.520
11	2 20 18.38	1.8850	8 27 22.3	9.486
12	2 22 11.52	1.8864	8 36 50.4	9.451
13	2 24 4.75	1.8880	8 46 16.4	9.416
14	2 25 58.08	1.8896	8 55 40.3	9.381
15	2 27 51.50	1.8912	9 5 2.1	9.345
16	2 29 45.02	1.8928	9 14 21.7	9.308
17	2 31 38.64	1.8945	9 23 39.0	9.270
18	2 33 32.36	1.8963	9 32 54.1	9.232
19	2 35 26.19	1.8981	9 42 6.9	9.194
20	2 37 20.13	1.8999	9 51 17.4	9.155
21	2 39 14.18	1.9017	10 0 25.5	9.115
22	2 41 8.34	1.9037	10 9 31.2	9.075
23	2 43 2.62	1.9057	N.10 18 34.5	9.034

SATURDAY 18.

0	2 44 57.02	1.9077	N.10 27 35.3	8.993
1	2 46 51.54	1.9098	10 36 33.6	8.951
2	2 48 46.19	1.9119	10 45 29.4	8.909
3	2 50 40.97	1.9141	10 54 22.7	8.867
4	2 52 35.88	1.9162	11 3 13.4	8.823
5	2 54 30.92	1.9184	11 12 1.4	8.778
6	2 56 26.09	1.9207	11 20 46.8	8.734
7	2 58 21.40	1.9231	11 29 29.5	8.688
8	3 0 16.86	1.9255	11 38 9.4	8.642
9	3 2 12.46	1.9278	11 46 46.6	8.596
10	3 4 8.20	1.9302	11 55 21.0	8.549
11	3 6 4.09	1.9327	12 3 52.5	8.502
12	3 8 0.13	1.9353	12 12 21.2	8.454
13	3 9 56.33	1.9379	12 20 47.0	8.405
14	3 11 52.68	1.9404	12 29 9.8	8.355
15	3 13 49.18	1.9430	12 37 29.6	8.305
16	3 15 45.84	1.9457	12 45 46.4	8.254
17	3 17 42.67	1.9485	12 54 0.1	8.203
18	3 19 39.66	1.9513	13 2 10.8	8.151
19	3 21 36.82	1.9541	13 10 18.3	8.099
20	3 23 34.15	1.9569	13 18 22.7	8.047
21	3 25 31.65	1.9598	13 26 23.9	7.993
22	3 27 29.32	1.9627	13 34 21.9	7.939
23	3 29 27.17	1.9657	13 42 16.6	7.884
24	3 31 25.20	1.9687	N.13 50 8.0	7.829

SUNDAY 19.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	3 31 25.20	1.9687	N.13 50 8.0	7.829
1	3 33 23.41	1.9717	13 57 56.1	7.773
2	3 35 21.80	1.9747	14 5 40.8	7.716
3	3 37 20.37	1.9778	14 13 22.0	7.658
4	3 39 19.13	1.9809	14 20 59.8	7.601
5	3 41 18.08	1.9841	14 28 34.1	7.542
6	3 43 17.22	1.9873	14 36 4.8	7.482
7	3 45 16.55	1.9905	14 43 31.9	7.423
8	3 47 16.08	1.9937	14 50 55.5	7.363
9	3 49 15.80	1.9970	14 58 15.5	7.302
10	3 51 15.72	2.0003	15 5 31.8	7.240
11	3 53 15.84	2.0036	15 12 44.3	7.178
12	3 55 16.15	2.0069	15 19 53.1	7.115
13	3 57 16.67	2.0104	15 26 58.1	7.051
14	3 59 17.40	2.0138	15 33 59.2	6.987
15	4 1 18.33	2.0172	15 40 56.5	6.922
16	4 3 19.47	2.0207	15 47 49.9	6.857
17	4 5 20.82	2.0243	15 54 39.3	6.790
18	4 7 22.39	2.0279	16 1 24.7	6.723
19	4 9 24.17	2.0314	16 8 6.1	6.656
20	4 11 26.16	2.0350	16 14 43.4	6.587
21	4 13 28.37	2.0386	16 21 16.6	6.518
22	4 15 30.79	2.0422	16 27 45.6	6.449
23	4 17 33.43	2.0458	N.16 34 10.5	6.380

MONDAY 20.

0	4 19 36.29	2.0495	N.16 40 31.2	6.309
1	4 21 39.37	2.0532	16 46 47.6	6.237
2	4 23 42.68	2.0570	16 52 59.6	6.164
3	4 25 46.21	2.0607	16 59 7.3	6.091
4	4 27 49.96	2.0644	17 5 10.6	6.018
5	4 29 53.94	2.0682	17 11 9.5	5.944
6	4 31 58.14	2.0719	17 17 3.9	5.869
7	4 34 2.57	2.0757	17 22 53.8	5.793
8	4 36 7.23	2.0796	17 28 39.1	5.717
9	4 38 12.12	2.0834	17 34 19.8	5.640
10	4 40 17.24	2.0872	17 39 55.9	5.562
11	4 42 22.59	2.0911	17 45 27.3	5.484
12	4 44 28.17	2.0950	17 50 54.0	5.406
13	4 46 33.99	2.0989	17 56 16.0	5.326
14	4 48 40.04	2.1028	18 1 33.1	5.245
15	4 50 46.32	2.1067	18 6 45.4	5.164
16	4 52 52.84	2.1106	18 11 52.8	5.082
17	4 54 59.59	2.1144	18 16 55.3	5.000
18	4 57 6.57	2.1183	18 21 52.8	4.917
19	4 59 13.79	2.1223	18 26 45.3	4.833
20	5 1 21.25	2.1262	18 31 32.8	4.749
21	5 3 28.94	2.1302	18 36 15.2	4.663
22	5 5 36.87	2.1341	18 40 52.4	4.577
23	5 7 45.03	2.1380	18 45 24.5	4.491
24	5 9 53.43	2.1420	N.18 49 51.4	4.404

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	TUESDAY 21.			
	h m s	s	° ′ ″	″
0	5 9 53.43	2.1420	N.18 49 51.4	4.404
1	5 12 2.07	2.1459	18 54 13.0	4.316
2	5 14 10.94	2.1498	18 58 29.3	4.228
3	5 16 20.05	2.1538	19 2 40.3	4.139
4	5 18 29.40	2.1577	19 6 46.0	4.049
5	5 20 38.98	2.1617	19 10 46.2	3.958
6	5 22 48.80	2.1656	19 14 40.9	3.866
7	5 24 58.85	2.1695	19 18 30.1	3.774
8	5 27 9.14	2.1734	19 22 13.8	3.682
9	5 29 19.66	2.1773	19 25 51.9	3.588
10	5 31 30.41	2.1812	19 29 24.4	3.494
11	5 33 41.40	2.1851	19 32 51.2	3.400
12	5 35 52.62	2.1889	19 36 12.4	3.305
13	5 38 4.07	2.1927	19 39 27.8	3.209
14	5 40 15.75	2.1966	19 42 37.4	3.112
15	5 42 27.66	2.2004	19 45 41.2	3.015
16	5 44 39.80	2.2043	19 48 39.2	2.917
17	5 46 52.17	2.2081	19 51 31.3	2.818
18	5 49 4.77	2.2118	19 54 17.4	2.719
19	5 51 17.59	2.2156	19 56 57.6	2.620
20	5 53 30.64	2.2193	19 59 31.8	2.519
21	5 55 43.91	2.2230	20 1 59.9	2.418
22	5 57 57.40	2.2267	20 4 21.9	2.316
23	6 0 11.11	2.2303	N.20 6 37.8	2.214
	WEDNESDAY 22.			
0	6 2 25.04	2.2340	N.20 8 47.6	2.111
1	6 4 39.19	2.2377	20 10 51.2	2.007
2	6 6 53.56	2.2413	20 12 48.5	1.903
3	6 9 8.14	2.2448	20 14 39.6	1.799
4	6 11 22.93	2.2484	20 16 24.4	1.693
5	6 13 37.93	2.2518	20 18 2.8	1.587
6	6 15 53.15	2.2553	20 19 34.8	1.480
7	6 18 8.57	2.2588	20 21 0.4	1.374
8	6 20 24.20	2.2622	20 22 19.6	1.267
9	6 22 40.03	2.2655	20 23 32.4	1.159
10	6 24 56.06	2.2688	20 24 38.7	1.050
11	6 27 12.29	2.2721	20 25 38.4	0.940
12	6 29 28.72	2.2754	20 26 31.5	0.830
13	6 31 45.34	2.2787	20 27 18.0	0.720
14	6 34 2.16	2.2819	20 27 57.9	0.610
15	6 36 19.17	2.2851	20 28 31.2	0.499
16	6 38 36.37	2.2882	20 28 57.8	0.387
17	6 40 53.75	2.2912	20 29 17.6	0.274
18	6 43 11.32	2.2943	20 29 30.7	0.161
19	6 45 29.07	2.2973	20 29 37.0	+ 0.048
20	6 47 47.00	2.3002	20 29 36.5	− 0.065
21	6 50 5.10	2.3032	20 29 29.2	0.179
22	6 52 23.38	2.3061	20 29 15.0	0.293
23	6 54 41.83	2.3089	20 28 54.0	0.407
24	6 57 0.44	2.3116	N.20 28 26.1	0.522
	THURSDAY 23.			
0	6 57 0.44	2.3116	N.20 28 26.1	0.522
1	6 59 19.22	2.3143	20 27 51.3	0.638
2	7 1 38.16	2.3170	20 27 9.5	0.755
3	7 3 57.26	2.3197	20 26 20.7	0.872
4	7 6 16.52	2.3223	20 25 24.9	0.988
5	7 8 35.93	2.3248	20 24 22.1	1.105
6	7 10 55.49	2.3273	20 23 12.3	1.222
7	7 13 15.20	2.3297	20 21 55.4	1.340
8	7 15 35.05	2.3320	20 20 31.5	1.458
9	7 17 55.04	2.3343	20 19 0.5	1.576
10	7 20 15.17	2.3366	20 17 22.4	1.694
11	7 22 35.43	2.3389	20 15 37.2	1.813
12	7 24 55.83	2.3411	20 13 44.8	1.932
13	7 27 16.36	2.3432	20 11 45.3	2.052
14	7 29 37.01	2.3452	20 9 38.6	2.172
15	7 31 57.78	2.3472	20 7 24.7	2.291
16	7 34 18.67	2.3491	20 5 3.7	2.410
17	7 36 39.67	2.3510	20 2 35.5	2.530
18	7 39 0.79	2.3529	20 0 0.1	2.650
19	7 41 22.02	2.3547	19 57 17.5	2.770
20	7 43 43.35	2.3564	19 54 27.7	2.891
21	7 46 4.78	2.3580	19 51 30.6	3.012
22	7 48 26.31	2.3597	19 48 26.3	3.132
23	7 50 47.94	2.3613	N.19 45 14.8	3.252
	FRIDAY 24.			
0	7 53 9.66	2.3628	N.19 41 56.0	3.373
1	7 55 31.47	2.3642	19 38 30.0	3.493
2	7 57 53.36	2.3656	19 34 56.8	3.614
3	8 0 15.34	2.3669	19 31 16.3	3.735
4	8 2 37.39	2.3682	19 27 28.6	3.855
5	8 4 59.52	2.3694	19 23 33.7	3.976
6	8 7 21.72	2.3706	19 19 31.5	4.097
7	8 9 43.99	2.3717	19 15 22.1	4.217
8	8 12 6.32	2.3727	19 11 5.5	4.337
9	8 14 28.71	2.3737	19 6 41.7	4.457
10	8 16 51.16	2.3747	19 2 10.6	4.577
11	8 19 13.67	2.3756	18 57 32.4	4.697
12	8 21 36.23	2.3764	18 52 47.0	4.817
13	8 23 58.84	2.3771	18 47 54.4	4.936
14	8 26 21.49	2.3778	18 42 54.7	5.055
15	8 28 44.18	2.3785	18 37 47.8	5.174
16	8 31 6.91	2.3791	18 32 33.8	5.293
17	8 33 29.67	2.3797	18 27 12.7	5.412
18	8 35 52.47	2.3802	18 21 44.4	5.531
19	8 38 15.29	2.3806	18 16 9.0	5.648
20	8 40 38.14	2.3810	18 10 26.6	5.765
21	8 43 1.01	2.3813	18 4 37.2	5.883
22	8 45 23.90	2.3817	17 58 40.7	6.000
23	8 47 46.81	2.3819	17 52 37.2	6.116
24	8 50 9.73	2.3821	N.17 46 26.8	6.232

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SATURDAY 25.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	8 50 9.73	2.3821	N.17 46 26.8	6.232
1	8 52 32.66	2.3822	17 40 9.4	6.347
2	8 54 55.60	2.3823	17 33 45.1	6.463
3	8 57 18.54	2.3823	17 27 13.8	6.578
4	8 59 41.48	2.3823	17 20 35.7	6.692
5	9 2 4.42	2.3823	17 13 50.8	6.805
6	9 4 27.36	2.3822	17 6 59.1	6.918
7	9 6 50.29	2.3821	17 0 0.6	7.031
8	9 9 13.21	2.3819	16 52 55.4	7.143
9	9 11 36.12	2.3817	16 45 43.5	7.254
10	9 13 59.01	2.3814	16 38 24.9	7.366
11	9 16 21.89	2.3811	16 30 59.6	7.477
12	9 18 44.75	2.3808	16 23 27.7	7.586
13	9 21 7.59	2.3804	16 15 49.3	7.694
14	9 23 30.40	2.3799	16 8 4.4	7.803
15	9 25 53.18	2.3794	16 0 12.9	7.911
16	9 28 15.93	2.3789	15 52 15.0	8.017
17	9 30 38.65	2.3784	15 44 10.8	8.123
18	9 33 1.34	2.3778	15 36 0.2	8.229
19	9 35 23.99	2.3772	15 27 43.3	8.333
20	9 37 46.60	2.3766	15 19 20.2	8.437
21	9 40 9.18	2.3760	15 10 50.8	8.541
22	9 42 31.72	2.3752	15 2 15.3	8.643
23	9 44 54.21	2.3744	N.14 53 33.7	8.744

SUNDAY 26.

0	9 47 16.65	2.3737	N.14 44 46.0	8.845
1	9 49 39.05	2.3729	14 35 52.3	8.944
2	9 52 1.40	2.3721	14 26 52.7	9.043
3	9 54 23.70	2.3712	14 17 47.2	9.141
4	9 56 45.95	2.3703	14 8 35.8	9.238
5	9 59 8.14	2.3694	13 59 18.6	9.334
6	10 1 30.28	2.3685	13 49 55.7	9.429
7	10 3 52.36	2.3676	13 40 27.1	9.523
8	10 6 14.39	2.3667	13 30 52.9	9.616
9	10 8 36.36	2.3657	13 21 13.2	9.707
10	10 10 58.27	2.3647	13 11 28.0	9.798
11	10 13 20.12	2.3637	13 1 37.4	9.888
12	10 15 41.91	2.3626	12 51 41.4	9.977
13	10 18 3.63	2.3615	12 41 40.1	10.065
14	10 20 25.29	2.3605	12 31 33.6	10.152
15	10 22 46.89	2.3594	12 21 21.9	10.237
16	10 25 8.42	2.3583	12 11 5.1	10.322
17	10 27 29.89	2.3572	12 0 43.2	10.406
18	10 29 51.29	2.3561	11 50 16.4	10.488
19	10 32 12.62	2.3550	11 39 44.7	10.569
20	10 34 33.89	2.3539	11 29 8.1	10.649
21	10 36 55.09	2.3527	11 18 26.8	10.727
22	10 39 16.22	2.3516	11 7 40.8	10.805
23	10 41 37.28	2.3505	10 56 50.2	10.881
24	10 43 58.28	2.3494	N.10 45 55.1	10.956

MONDAY 27.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	10 43 58.28	2.3494	N.10 45 55.1	10.956
1	10 46 19.21	2.3482	10 34 55.5	11.030
2	10 48 40.06	2.3470	10 23 51.5	11.102
3	10 51 0.85	2.3459	10 12 43.2	11.174
4	10 53 21.57	2.3447	10 1 30.6	11.244
5	10 55 42.22	2.3436	9 50 13.9	11.312
6	10 58 2.80	2.3424	9 38 53.1	11.380
7	11 0 23.31	2.3413	9 27 28.3	11.447
8	11 2 43.75	2.3402	9 15 59.5	11.512
9	11 5 4.13	2.3391	9 4 26.9	11.575
10	11 7 24.44	2.3379	8 52 50.5	11.637
11	11 9 44.68	2.3368	8 41 10.4	11.698
12	11 12 4.85	2.3357	8 29 26.7	11.758
13	11 14 24.96	2.3346	8 17 39.5	11.816
14	11 16 45.00	2.3334	8 5 48.8	11.872
15	11 19 4.97	2.3323	7 53 54.8	11.927
16	11 21 24.88	2.3313	7 41 57.5	11.982
17	11 23 44.73	2.3303	7 29 57.0	12.035
18	11 26 4.52	2.3293	7 17 53.3	12.087
19	11 28 24.25	2.3282	7 5 46.6	12.136
20	11 30 43.91	2.3272	6 53 37.0	12.184
21	11 33 3.51	2.3262	6 41 24.5	12.232
22	11 35 23.05	2.3253	6 29 9.2	12.277
23	11 37 42.54	2.3243	N. 6 16 51.2	12.321

TUESDAY 28.

0	11 40 1.97	2.3233	N. 6 4 30.7	12.363
1	11 42 21.34	2.3224	5 52 7.7	12.404
2	11 44 40.66	2.3216	5 39 42.2	12.445
3	11 46 59.93	2.3207	5 27 14.3	12.483
4	11 49 19.15	2.3198	5 14 44.2	12.520
5	11 51 38.31	2.3189	5 2 11.9	12.555
6	11 53 57.42	2.3182	4 49 37.6	12.588
7	11 56 16.49	2.3174	4 37 1.3	12.621
8	11 58 35.51	2.3166	4 24 23.1	12.652
9	12 0 54.48	2.3158	4 11 43.0	12.682
10	12 3 13.41	2.3151	3 59 1.2	12.710
11	12 5 32.30	2.3144	3 46 17.8	12.737
12	12 7 51.14	2.3137	3 33 32.8	12.762
13	12 10 9.94	2.3131	3 20 46.4	12.785
14	12 12 28.71	2.3126	3 7 58.6	12.807
15	12 14 47.45	2.3120	2 55 9.6	12.827
16	12 17 6.15	2.3114	2 42 19.4	12.846
17	12 19 24.82	2.3109	2 29 28.1	12.864
18	12 21 43.46	2.3104	2 16 35.7	12.881
19	12 24 2.07	2.3099	2 3 42.4	12.895
20	12 26 20.65	2.3095	1 50 48.3	12.907
21	12 28 39.21	2.3091	1 37 53.5	12.918
22	12 30 57.74	2.3087	1 24 58.1	12.928
23	12 33 16.25	2.3083	1 12 2.1	12.937
24	12 35 34.74	2.3080	N. 0 59 5.6	12.945

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	WEDNESDAY 29.			
	h m s	s	° ′ ″	″
0	12 35 34.74	2.3080	N. 0 59 5.6	12.945
1	12 37 53.21	2.3077	0 46 8.7	12.950
2	12 40 11.67	2.3075	0 33 11.6	12.953
3	12 42 30.11	2.3073	0 20 14.3	12.956
4	12 44 48.54	2.3071	N. 0 7 16.9	12.957
5	12 47 6.96	2.3069	S. 0 5 40.5	12.957
6	12 49 25.37	2.3068	0 18 37.9	12.955
7	12 51 43.77	2.3067	0 31 35.1	12.951
8	12 54 2.17	2.3067	0 44 32.0	12.946
9	12 56 20.57	2.3067	0 57 28.6	12.940
10	12 58 38.97	2.3067	1 10 24.8	12.932
11	13 0 57.37	2.3067	1 23 20.4	12.922
12	13 3 15.77	2.3068	1 36 15.4	12.911
13	13 5 34.18	2.3068	1 49 9.7	12.898
14	13 7 52.59	2.3069	2 2 3.2	12.885
15	13 10 11.01	2.3071	2 14 55.9	12.870
16	13 12 29.44	2.3073	2 27 47.6	12.852
17	13 14 47.89	2.3076	2 40 38.2	12.833
18	13 17 6.35	2.3078	2 53 27.6	12.813
19	13 19 24.83	2.3081	3 6 15.8	12.792
20	13 21 43.33	2.3085	3 19 2.7	12.770
21	13 24 1.85	2.3088	3 31 48.2	12.746
22	13 26 20.39	2.3092	3 44 32.2	12.720
23	13 28 38.96	2.3097	S. 3 57 14.6	12.692
	THURSDAY, MARCH 1.			
0	13 30 57.55	2.3101	S. 4 9 55.3	12.664

PHASES OF THE MOON.

		d	h	m
☾	Last Quarter. . Feb.	4	7	25.7
●	New Moon	11	11	52.4
☽	First Quarter . . .	19	13	59.2
○	Full Moon	26	23	57.6

		d	h
☾	Perigee. . . . Feb.	1	17.2
☾	Apogee.	17	9.5
☾	Perigee.	29	4.3

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	III^h.	P. L. of Diff.	VI^h.	P. L. of Diff.	IX^h.	P. L. of Diff.
1	Pollux W.	66° 15′ 22″	2301	68° 1′ 20″	2299	69° 47′ 21″	2298	71° 33′ 24″	2296
	Saturn W.	55 53 48	2225	57 41 39	2224	59 29 31	2223	61 17 24	2223
	Regulus W.	30 6 19	2251	31 53 31	2250	33 40 44	2249	35 27 58	2249
	Jupiter E.	64 31 59	2302	62 46 2	2302	61 0 5	2302	59 14 8	2302
	Antares E.	70 26 24	2311	68 40 41	2312	66 54 59	2314	65 9 20	2316
	Venus E.	94 21 12	2630	92 42 58	2630	91 4 44	2629	89 26 29	2629
	Sun E.	133 47 2	2565	132 7 19	2565	130 27 36	2564	128 47 52	2564
2	Pollux W.	80 23 48	2298	82 9 50	2300	83 55 50	2301	85 41 48	2302
	Saturn W.	70 16 36	2229	72 4 21	2230	73 52 4	2232	75 39 44	2235
	Regulus W.	44 24 0	2253	46 11 8	2255	47 58 14	2257	49 45 17	2259
	Jupiter E.	50 24 45	2311	48 39 1	2313	46 53 20	2316	45 7 44	2320
	Antares E.	56 22 5	2335	54 36 56	2340	52 51 55	2346	51 7 3	2353
	Venus E.	81 15 26	2635	79 37 18	2637	77 59 13	2640	76 21 12	2642
	Sun E.	120 29 23	2569	118 49 46	2572	117 10 12	2574	115 30 41	2576
3	Saturn W.	84 37 8	2248	86 24 24	2251	88 11 35	2255	89 58 41	2258
	Regulus W.	58 39 40	2272	60 26 20	2276	62 12 55	2279	63 59 25	2283
	Jupiter E.	36 21 8	2342	34 36 10	2348	32 51 21	2355	31 6 42	2363
	Antares E.	42 25 36	2401	40 42 3	2414	38 58 48	2429	37 15 54	2945
	Venus E.	68 11 59	2657	66 34 22	2660	64 56 49	2664	63 19 21	2669
	α Aquilæ E.	90 23 2	2825	88 49 6	2828	87 15 15	2833	85 41 30	2839
	Sun E.	107 13 59	2591	105 34 52	2594	103 55 49	2598	102 16 51	2602
4	Saturn W.	98 52 48	2279	100 39 19	2283	102 25 44	2287	104 12 3	2291
	Regulus W.	72 50 33	2302	74 36 29	2306	76 22 19	2311	78 8 2	2315
	Spica W.	20 10 1	2576	21 49 29	2541	23 29 45	2515	25 10 38	2494
	Mars W.	15 31 44	2450	17 14 8	2443	18 56 42	2438	20 39 22	2436
	Venus E.	55 13 28	2690	53 36 35	2695	51 59 49	2701	50 23 10	2705
	α Aquilæ E.	77 55 16	2887	76 22 41	2901	74 50 23	2915	73 18 23	2931
	Sun E.	94 3 26	2623	92 25 2	2628	90 46 45	2633	89 8 35	2638
5	Regulus W.	86 54 58	2339	88 40 1	2344	90 24 56	2349	92 9 44	2355
	Spica W.	33 40 26	2443	35 22 59	2440	37 5 37	2438	38 48 18	2436
	Mars W.	29 12 47	2443	30 55 21	2446	32 37 50	2450	34 20 14	2453
	Venus E.	42 21 37	2732	40 45 40	2738	39 9 51	2744	37 34 9	2750
	Aquilæ E.	65 44 0	3033	64 14 28	3059	62 45 28	3087	61 17 3	3117
	Sun E.	80 59 24	2663	79 21 55	2669	77 44 33	2674	76 7 18	2680
6	Spica W.	47 21 50	2441	49 4 27	2443	50 47 1	2445	52 29 31	2449
	Mars W.	42 50 53	2475	44 32 42	2479	46 14 25	2484	47 56 1	2489
	Venus E.	29 37 39	2781	28 2 46	2788	26 28 2	2795	24 53 27	2801
	α Aquilæ E.	54 5 7	3313	52 41 10	3363	51 18 11	3417	49 56 14	3476
	Sun E.	68 2 59	2708	66 26 30	2714	64 50 9	2720	63 13 56	2727
7	Spica W.	61 0 43	2470	62 42 39	2475	64 24 28	2480	66 6 10	2485
	Mars W.	56 22 10	2516	58 3 1	2522	59 43 44	2527	61 24 19	2533
	Jupiter W.	19 43 24	2551	21 23 27	2545	23 3 38	2541	24 43 54	2540
	Sun E.	55 14 59	2759	53 39 37	2766	52 4 24	2772	50 29 20	2779
8	Spica W.	74 32 43	2515	76 13 36	2521	77 54 20	2527	79 34 55	2535
	Mars W.	69 45 5	2565	71 24 48	2572	73 4 21	2579	74 43 45	2585

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^h.	P. L. of Diff.	XVIII^h.	P. L. of Diff.	XXI^h.	P. L. of Diff.
1	Pollux	W.	73° 19′ 29″	2296	75° 5′ 34″	2296	76° 51′ 39″	2296	78° 37′ 44″	2297
	Saturn	W.	63 5 17	2224	64 53 9	2225	66 41 0	2226	68 28 49	2227
	Regulus	W.	37 15 12	2250	39 2 25	2250	40 49 38	2251	42 36 50	2252
	Jupiter	E.	57 28 12	2303	55 42 17	2304	53 56 24	2306	52 10 33	2308
	Antares	E.	63 23 44	2319	61 38 12	2322	59 52 44	2325	58 7 21	2330
	Venus	E.	87 48 14	2630	86 10 0	2631	84 31 47	2632	82 53 36	2633
	Sun	E.	127 8 8	2565	125 28 25	2566	123 48 43	2566	122 9 2	2568
2	Pollux	W.	87 27 44	2305	89 13 36	2308	90 59 24	2311	92 45 8	2314
	Saturn	W.	77 27 20	2237	79 14 53	2239	81 2 22	2242	82 49 47	2245
	Regulus	W.	51 32 17	2261	53 19 14	2264	55 6 7	2266	56 52 56	2270
	Jupiter	E.	43 22 13	2323	41 36 47	2327	39 51 27	2332	38 6 14	2337
	Antares	E.	49 22 21	2361	47 37 50	2369	45 53 31	2379	44 9 26	2389
	Venus	E.	74 43 14	2644	73 5 19	2647	71 27 28	2650	69 49 41	2654
	Sun	E.	113 51 13	2579	112 11 49	2581	110 32 28	2584	108 53 11	2588
3	Saturn	W.	91 45 42	2262	93 32 37	2266	95 19 27	2270	97 6 11	2274
	Regulus	W.	65 45 50	2287	67 32 9	2290	69 18 23	2294	71 4 31	2298
	Jupiter	E.	29 22 14	2371	27 37 58	2380	25 53 55	2391	24 10 7	2403
	Antares	E.	35 33 23	2464	33 51 19	2485	32 9 44	2508	30 28 42	2536
	Venus	E.	61 41 59	2673	60 4 43	2677	58 27 32	2681	56 50 27	2686
	α Aquilæ	E.	84 7 53	2847	82 34 26	2855	81 1 10	2865	79 28 6	2876
	Sun	E.	100 37 59	2606	98 59 12	2610	97 20 31	2615	95 41 56	2618
4	Saturn	W.	105 58 15	2296	107 44 20	2301	109 30 18	2305	111 16 10	2311
	Regulus	W.	79 53 39	2320	81 39 9	2325	83 24 32	2330	85 9 48	2334
	Spica	W.	26 52 0	2478	28 33 44	2465	30 15 46	2456	31 58 1	2449
	Mars	W.	22 22 5	2436	24 4 48	2437	25 47 30	2438	27 30 10	2441
	Venus	E.	48 46 37	2710	47 10 11	2716	45 33 52	2722	43 57 41	2727
	α Aquilæ	E.	71 46 43	2948	70 15 25	2966	68 44 30	2987	67 14 1	3009
	Sun	E.	87 30 31	2643	85 52 34	2648	84 14 44	2652	82 37 0	2658
5	Regulus	W.	93 54 24	2360	95 38 56	2365	97 23 21	2370	99 7 39	2375
	Spica	W.	40 31 1	2436	42 13 45	2436	43 56 28	2437	45 39 10	2438
	Mars	W.	36 2 33	2457	37 44 47	2461	39 26 55	2465	41 8 57	2470
	Venus	E.	35 58 35	2756	34 23 9	2762	32 47 51	2768	31° 12 41	2774
	α Aquilæ	E.	59 49 14	3149	58 22 4	3185	56 55 37	3225	55 29 57	3267
	Sun	E.	74 30 11	2686	72 53 12	2691	71 16 20	2697	69 39 36	2702
6	Spica	W.	54 11 56	2453	55 54 16	2456	57 36 31	2460	59 18 40	2465
	Mars	W.	49 37 30	2494	51 18 51	2499	53 0 5	2505	54 41 11	2510
	Venus	E.	23 19 1	2809	21 44 45	2817	20 10 39	2825	18 36 43	2834
	α Aquilæ	E.	48 35 23	3542	47 15 45	3613	45 57 25	3692	44 40 29	3778
	Sun	E.	61 37 52	2733	60 1 56	2739	58 26 8	2746	56 50 29	2753
7	Spica	W.	67 47 45	2490	69 29 12	2496	71 10 31	2502	72 51 41	2508
	Mars	W.	63 4 46	2540	64 45 4	2546	66 25 13	2553	68 5 13	2559
	Jupiter	W.	26 24 12	2540	28 4 30	2541	29 44 46	2544	31 24 58	2548
	Sun	E.	48 54 25	2786	47 19 39	2794	45 45 3	2801	44 10 37	2808
8	Spica	W.	81 15 20	2541	82 55 36	2548	84 35 42	2556	86 15 37	2564
	Mars	W.	76 23 0	2593	78 2 5	2600	79 41 0	2607	81 19 45	2615

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	III^h.	P. L. of Diff.	VI^h.	P. L. of Diff.	IX^h.	P. L. of Diff.
8	JUPITER	W.	33° 5′ 5″	2551	34° 45′ 7″	2555	36° 25′ 4″	2559	38° 4′ 55″	2565
	Antares	W.	29 25 30	2710	31 1 57	2695	32 38 44	2684	34 15 46	2675
	SUN	E.	42 36 20	2816	41 2 13	2824	39 28 16	2831	37 54 29	2839
9	Spica	W.	87 55 22	2572	89 34 56	2580	91 14 19	2588	92 53 31	2596
	MARS	W.	82 58 19	2623	84 36 43	2630	86 14 57	2638	87 53 0	2647
	JUPITER	W.	46 22 10	2596	48 1 10	2603	49 40 1	2610	51 18 42	2618
	Antares	W.	42 22 55	2660	44 0 29	2661	45 38 1	2663	47 15 31	2665
	SUN	E.	30 8 14	2883	28 35 33	2891	27 3 3	2900	25 30 44	2909
13	SUN	W.	17 41 39	3220	19 7 24	3231	20 32 57	3240	21 58 19	3251
	α Arietis	E.	55 35 48	3082	54 7 16	3101	52 39 8	3122	51 11 25	3143
	Aldebaran	E.	86 13 33	2845	84 40 4	2856	83 6 49	2866	81 33 47	2876
14	SUN	W.	29 2 7	3300	30 26 18	3311	31 50 17	3320	33 14 5	3330
	α Arietis	E.	43 59 39	3268	42 34 50	3298	41 10 36	3330	39 46 59	3365
	Aldebaran	E.	73 51 47	2925	72 20 0	2934	70 48 24	2942	69 16 59	2952
15	SUN	W.	40 10 25	3374	41 33 11	3382	42 55 48	3390	44 18 16	3397
	Aldebaran	E.	61 42 41	2993	60 12 20	3001	58 42 9	3009	57 12 7	3015
	Pollux	E.	105 47 3	3042	104 17 42	3048	102 48 29	3055	101 19 24	3061
16	SUN	W.	51 8 35	3431	52 30 17	3436	53 51 53	3440	55 13 24	3446
	Aldebaran	E.	49 43 57	3046	48 14 41	3051	46 45 31	3056	45 16 27	3060
	Pollux	E.	93 55 55	3091	92 27 34	3096	90 59 19	3100	89 31 9	3104
17	SUN	W.	61 59 48	3462	63 20 55	3464	64 41 59	3465	66 3 2	3467
	Aldebaran	E.	37 52 17	3075	36 23 37	3078	34 55 0	3079	33 26 25	3080
	Pollux	E.	82 11 30	3120	80 43 45	3123	79 16 3	3125	77 48 24	3126
	SATURN	E.	91 1 8	3051	89 31 58	3052	88 2 50	3054	86 33 44	3055
18	SUN	W.	72 48 9	3464	74 9 13	3463	75 30 19	3460	76 51 28	3456
	Pollux	E.	70 30 23	3128	69 2 47	3127	67 35 10	3125	66 7 31	3124
	SATURN	E.	79 8 21	3053	77 39 14	3052	76 10 5	3049	74 40 53	3047
19	SUN	W.	83 38 17	3433	84 59 56	3427	86 21 42	3421	87 43 35	3413
	α Arietis	W.	23 17 35	4234	24 25 29	4099	25 35 32	3982	26 47 29	3883
	Pollux	E.	58 48 43	3111	57 20 47	3108	55 52 47	3103	54 24 41	3099
	SATURN	E.	67 13 52	3026	65 44 11	3020	64 14 23	3014	62 44 27	3007
	Regulus	E.	94 21 37	3049	92 52 25	3043	91 23 6	3037	89 53 39	3030
20	SUN	W.	94 35 19	3369	95 58 11	3358	97 21 15	3348	98 44 31	3336
	α Arietis	W.	33 9 8	3535	34 28 54	3484	35 49 36	3438	37 11 9	3396
	Pollux	E.	47 2 53	3076	45 34 14	3071	44 5 29	3066	42 36 38	3062
	SATURN	E.	55 12 35	2967	53 41 41	2958	52 10 36	2948	50 39 18	2938
	Regulus	E.	82 24 8	2990	80 53 43	2981	79 23 6	2970	77 52 15	2959
21	SUN	W.	105 44 21	3272	107 9 5	3259	108 34 5	3244	109 59 22	3230
	α Arietis	W.	44 9 56	3223	45 35 38	3193	47 1 56	3165	48 28 47	3138
	Pollux	E.	35 11 6	3045	33 41 49	3044	32 12 31	3044	30 43 13	3047
	SATURN	E.	42 59 23	2880	41 26 39	2868	39 53 39	2855	38 20 22	2842
	Regulus	E.	70 14 35	2901	68 42 18	2888	67 9 44	2875	65 36 53	2861

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^h.	P. L. of Diff.	XVIII^h.	P. L. of Diff.	XXI^h.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
8	JUPITER	W.	39 44 38	2570	41 24 14	2576	43 3 42	2583	44 43 1	2590
	Antares	W.	35 53 0	2669	37 30 22	2665	39 7 49	2661	40 45 21	2660
	SUN	E.	36 20 52	2848	34 47 26	2856	33 14 11	2865	31 41 7	2873
9	Spica	W.	94 32 31	2605	96 11 19	2614	97 49 55	2622	99 28 20	2631
	MARS	W.	89 30 51	2655	91 8 32	2663	92 46 2	2672	94 23 20	2681
	JUPITER	W.	52 57 13	2626	54 35 33	2633	56 13 43	2641	57 51 42	2649
	Antares	W.	48 52 58	2669	50 30 20	2672	52 7 37	2677	53 44 48	2683
	SUN	E.	23 58 37	2920	22 26 43	2930	20 55 2	2940	19 23 34	2951
13	SUN	W.	23 23 28	3261	24 48 25	3270	26 13 11	3281	27 37 45	3291
	α Arietis	E.	49 44 7	3165	48 17 16	3189	46 50 54	3214	45 25 1	3240
	Aldebaran	E.	80 0 58	2887	78 28 22	2896	76 55 58	2905	75 23 46	2916
14	SUN	W.	34 37 42	3338	36 1 9	3348	37 24 25	3358	38 47 30	3366
	α Arietis	E.	38 24 2	2401	37 1 47	3442	35 40 18	3487	34 19 39	3536
	Aldebaran	E.	67 45 46	2961	66 14 44	2969	64 43 53	2977	63 13 12	2985
15	SUN	W.	45 40 36	3405	47 2 47	3412	48 24 50	3418	49 46 46	3424
	Aldebaran	E.	55 42 13	3022	54 12 27	3028	52 42 49	3034	51 13 19	3041
	Pollux	E.	99 50 27	3068	98 21 38	3074	96 52 57	3080	95 24 23	3085
16	SUN	W.	56 34 49	3450	57 56 9	3454	59 17 25	3456	60 38 38	3459
	Aldebaran	E.	43 47 28	3065	42 18 35	3068	40 49 46	3070	39 21 0	3073
	Pollux	E.	88 3 4	3108	86 35 4	3112	85 7 9	3115	83 39 18	3118
17	SUN	W.	67 24 3	3468	68 45 3	3467	70 6 4	3466	71 27 6	3465
	Aldebaran	E.	31 57 51	3081	30 29 18	3081	29 0 45	3081	27 32 12	3080
	Pollux	E.	76 20 46	3127	74 53 9	3128	73 25 33	3129	71 57 58	3129
	SATURN	E.	85 4 39	3056	83 35 35	3056	82 6 31	3055	80 37 26	3055
18	SUN	W.	78 12 41	3453	79 33 58	3449	80 55 19	3445	82 16 45	3439
	Pollux	E.	64 39 51	3123	63 12 9	3120	61 44 24	3117	60 16 35	3114
	SATURN	E.	73 11 38	3043	71 42 19	3039	70 12 55	3035	68 43 26	3031
19	SUN	W.	89 5 37	3405	90 27 48	3397	91 50 8	3388	93 12 38	3379
	α Arietis	W.	28 1 6	3795	29 16 13	3718	30 32 41	3649	31 50 22	3589
	Pollux	E.	52 56 30	3095	51 28 14	3091	49 59 53	3086	48 31 26	3081
	SATURN	E.	61 14 23	3001	59 44 11	2993	58 13 50	2985	56 43 18	2976
	Regulus	E.	88 24 4	3023	86 54 20	3015	85 24 26	3007	83 54 22	2999
20	SUN	W.	100 8 1	3325	101 31 44	3313	102 55 41	3300	104 19 53	3286
	α Arietis	W.	38 33 30	3357	39 56 36	3330	41 20 24	3287	42 44 51	3254
	Pollux	E.	41 7 42	3057	39 38 40	3053	38 9 33	3049	36 40 21	3047
	SATURN	E.	49 7 47	2927	47 36 3	2916	46 4 4	2905	44 31 51	2893
	Regulus	E.	76 21 11	2949	74 49 54	2938	73 18 23	2926	71 46 37	2913
21	SUN	W.	111 24 56	3214	112 50 48	3198	114 16 59	3183	115 43 28	3167
	α Arietis	W.	49 56 11	3111	51 24 7	3085	52 52 35	3060	54 21 33	3036
	Pollux	E.	29 13 58	3052	27 44 50	3060	26 15 52	3073	24 47 9	3090
	SATURN	E.	36 46 48	2828	35 12 56	2814	33 38 46	2799	32 4 17	2785
	Regulus	E.	64 3 44	2847	62 30 17	2833	60 56 32	2818	59 22 28	2803

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LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	III^h.	P. L. of Diff.	VI^h.	P. L. of Diff.	IX^h.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
22	Sun	W.	117 10 17	3150	118 37 26	3133	120 4 55	3117	121 32 44	3099
	α Arietis	W.	55 51 1	3012	57 20 59	2989	58 51 26	2965	60 22 22	2943
	Aldebaran	W.	22 23 0	2789	23 57 42	2774	25 32 44	2758	27 8 7	2741
	Saturn	E.	30 29 29	2770	28 54 22	2756	27 18 56	2741	25 43 10	2725
	Regulus	E.	57 48 4	2788	56 13 20	2772	54 38 16	2756	53 2 51	2741
	Spica	E.	111 32 0	2825	109 58 4	2808	108 23 46	2792	106 49 7	2775
23	Sun	W.	128 57 14	3010	130 27 14	2992	131 57 37	2973	133 28 23	2956
	α Arietis	W.	68 4 4	2835	69 37 47	2814	71 11 57	2793	72 46 34	2773
	Aldebaran	W.	35 10 34	2657	36 48 11	2640	38 26 12	2623	40 4 36	2605
	Regulus	E.	45 0 23	2658	43 22 46	2641	41 44 47	2624	40 6 25	2607
	Spica	E.	98 50 19	2689	97 13 25	2672	95 36 7	2655	93 58 26	2638
	Mars	E.	106 22 8	2698	104 45 25	2681	103 8 19	2663	101 30 49	2645
24	Aldebaran	W.	48 22 34	2518	50 3 22	2501	51 44 34	2485	53 26 9	2467
	Regulus	E.	31 48 40	2522	30 7 57	2504	28 26 50	2488	26 45 20	2471
	Spica	E.	85 44 9	2551	84 4 6	2534	82 23 40	2517	80 42 50	2500
	Mars	E.	93 17 14	2555	91 37 17	2538	89 56 56	2520	88 16 10	2502
25	Aldebaran	W.	62 0 3	2384	63 44 0	2368	65 28 20	2353	67 13 2	2337
	Spica	E.	72 12 57	2420	70 29 51	2405	68 46 24	2391	67 2 36	2377
	Mars	E.	79 46 15	2417	78 3 4	2401	76 19 30	2384	74 35 33	2369
	Jupiter	E.	115 15 23	2419	113 32 16	2403	111 48 46	2387	110 4 53	2371
26	Aldebaran	W.	76 1 57	2267	77 48 45	2254	79 35 52	2241	81 23 18	2229
	Pollux	W.	32 44 1	2419	34 27 9	2391	36 10 56	2367	37 55 18	2346
	Saturn	W.	23 28 24	2257	25 15 27	2243	27 2 51	2229	28 50 35	2216
	Spica	E.	58 18 42	2313	56 33 1	2302	54 47 4	2291	53 0 52	2282
	Mars	E.	65 50 20	2296	64 4 15	2283	62 17 50	2270	60 31 6	2258
	Jupiter	E.	101 19 58	2299	99 33 57	2285	97 47 36	2273	96 0 57	2261
	Antares	E.	104 11 56	2325	102 26 33	2311	100 40 50	2298	98 54 47	2285
27	Aldebaran	W.	90 24 42	2177	92 13 44	2168	94 3 0	2160	95 52 28	2152
	Pollux	W.	46 44 12	2260	48 31 11	2247	50 18 29	2234	52 6 6	2223
	Saturn	W.	37 53 38	2163	39 43 1	2154	41 32 38	2145	43 22 28	2138
	Spica	E.	44 6 44	2247	42 19 26	2243	40 32 2	2241	38 44 35	2240
	Mars	E.	51 33 9	2204	49 44 47	2195	47 56 12	2186	46 7 24	2179
	Jupiter	E.	87 3 24	2207	85 15 7	2198	83 26 37	2190	81 37 54	2182
	Antares	E.	90 0 15	2231	88 12 34	2223	86 24 40	2215	84 36 35	2208
28	Pollux	W.	61 7 58	2179	62 56 57	2173	64 46 5	2168	66 35 21	2164
	Saturn	W.	52 34 16	2107	54 25 4	2103	56 15 58	2099	58 6 58	2097
	Regulus	W.	24 54 35	2126	26 44 54	2122	28 35 20	2118	30 25 52	2115
	Mars	E.	37 0 50	2151	35 11 8	2147	33 21 20	2144	31 31 28	2142
	Jupiter	E.	72 31 40	2153	70 42 1	2148	68 52 15	2144	67 2 23	2141
	Antares	E.	75 33 43	2181	73 44 47	2178	71 55 46	2175	70 6 41	2174
29	Pollux	W.	75 42 58	2153	77 32 37	2152	79 22 18	2153	81 11 56	2154
	Saturn	W.	67 22 47	2091	69 14 0	2091	71 5 13	2092	72 56 24	2094
	Regulus	W.	39 39 30	2107	41 30 19	2107	43 21 7	2109	45 11 53	2110
	Jupiter	E.	57 52 21	2137	56 2 19	2138	54 12 18	2140	52 22 20	2142
	Antares	E.	61 1 8	2178	59 12 7	2182	57 23 12	2186	55 34 24	2191

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Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^h.	P. L. of Diff.	XVIII^h.	P. L. of Diff.	XXI^h.	P. L. of Diff.
22	Sun	W.	123° 0′ 55″	3082	124° 29′ 27″	3064	125° 58′ 21″	3047	127° 27′ 36″	3028
	α Arietis	W.	61 53 46	2920	63 25 39	2898	64 58 0	2877	66 30 48	2855
	Aldebaran	W.	28 43 52	2725	30 19 59	2708	31 56 28	2691	33 33 20	2675
	Saturn	E.	24 7 3	2710	22 30 36	2695	20 53 49	2679	19 16 41	2665
	Regulus	E.	51 27 5	2724	49 50 57	2708	48 14 28	2692	46 37 37	2675
	Spica	E.	105 14 6	2758	103 38 43	2741	102 2 58	2724	100 26 50	2707
23	Sun	W.	134 59 31	2938	136 31 2	2919	138 2 57	2901	139 35 15	2883
	α Arietis	W.	74 21 37	2753	75 57 7	2733	77 33 3	2713	79 9 25	2694
	Aldebaran	W.	41 43 24	2588	43 22 36	2571	45 2 11	2553	46 42 10	2535
	Regulus	E.	38 27 39	2590	36 48 30	2572	35 8 57	2555	33 29 0	2538
	Spica	E.	92 20 22	2620	90 41 54	2603	89 3 3	2585	87 23 48	2568
	Mars	E.	99 52 55	2627	98 14 37	2609	96 35 54	2591	94 56 46	2573
24	Aldebaran	W.	55 8 8	2450	56 50 31	2433	58 33 18	2417	60 16 29	2401
	Regulus	E.	25 3 26	2455	23 21 9	2439	21 38 30	2424	19 55 30	2410
	Spica	E.	79 1 37	2484	77 20 1	2467	75 38 2	2452	73 55 41	2436
	Mars	E.	86 34 59	2485	84 53 24	2467	83 11 25	2450	81 29 2	2433
25	Aldebaran	W.	68 58 7	2322	70 43 34	2309	72 29 21	2294	74 15 29	2281
	Spica	E.	65 18 28	2363	63 34 0	2349	61 49 12	2337	60 4 6	2324
	Mars	E.	72 51 14	2354	71 6 33	2339	69 21 30	2324	67 36 5	2310
	Jupiter	E.	108 20 37	2356	106 35 59	2341	104 50 59	2327	103 5 39	2313
26	Aldebaran	W.	83 11 2	2218	84 59 3	2206	86 47 21	2196	88 35 54	2186
	Pollux	W.	39 40 11	2326	41 25 32	2308	43 11 20	2290	44 57 34	2274
	Saturn	W.	30 38 38	2204	32 26 59	2193	34 15 37	2183	36 4 30	2173
	Spica	E.	51 14 26	2273	49 27 47	2265	47 40 56	2258	45 53 54	2252
	Mars	E.	58 44 4	2245	56 56 44	2235	55 9 8	2224	53 21 16	2214
	Jupiter	E.	94 14 0	2249	92 26 45	2238	90 39 14	2227	88 51 27	2216
	Antares	E.	97 8 26	2273	95 21 47	2262	93 34 52	2251	91 47 41	2241
27	Aldebaran	W.	97 42 8	2145	99 31 59	2138	101 22 0	2132	103 12 10	2127
	Pollux	W.	53 54 0	2212	55 42 9	2202	57 30 33	2194	59 19 10	2186
	Saturn	W.	45 12 29	2131	47 2 41	2124	48 53 4	2118	50 43 36	2113
	Spica	E.	36 57 7	2241	35 9 40	2243	33 22 16	2247	31 34 58	2254
	Mars	E.	44 18 25	2172	42 29 15	2165	40 39 55	2159	38 50 26	2155
	Jupiter	E.	79 48 59	2174	77 59 53	2168	76 10 37	2162	74 21 12	2157
	Antares	E.	82 48 19	2201	80 59 53	2194	79 11 17	2189	77 22 33	2185
28	Pollux	W.	68 24 43	2160	70 14 11	2157	72 3 44	2155	73 53 20	2153
	Saturn	W.	59 58 2	2094	61 49 10	2092	63 40 21	2091	65 31 34	2091
	Regulus	W.	32 16 29	2112	34 7 10	2109	35 57 55	2108	37 48 42	2107
	Mars	E.	29 41 33	2141	27 51 37	2141	26 1 41	2142	24 11 46	2144
	Jupiter	E.	65 12 27	2139	63 22 28	2138	61 32 27	2137	59 42 24	2137
	Antares	E.	68 17 34	2173	66 28 26	2173	64 39 18	2174	62 50 12	2176
29	Pollux	W.	83 1 33	2156	84 51 7	2158	86 40 38	2161	88 30 4	2165
	Saturn	W.	71 47 32	2096	76 38 37	2099	78 29 37	2103	80 20 32	2107
	Regulus	W.	47 2 37	2113	48 53 17	2115	50 43 53	2118	52 34 25	2121
	Jupiter	E.	50 32 25	2145	48 42 34	2149	46 52 49	2153	45 3 10	2158
	Antares	E.	53 45 43	2197	51 57 11	2204	50 8 50	2214	48 20 43	2223

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.	Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Added to Apparent Time.	Diff. for 1 Hour.
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Thur.	1	22 51 19.75	9.344	S. 7 17 48.8	+57.15	16 10.25	65.38	12 24.98	0.511
Frid.	2	22 55 3.75	9.324	6 54 54.1	57.40	16 10 00	65.31	12 12.45	0.531
Sat.	3	22 58 47.28	9 305	6 31 53.5	57.64	16 9.74	65.24	11 59.46	0.550
SUN.	4	23 2 30.36	9.287	6 8 47.3	+57.86	16 9.49	65.17	11 46.03	0.568
Mon.	5	23 6 13.03	9.270	5 45 36.1	58.07	16 9.23	65.11	11 32.18	0.585
Tues.	6	23 9 55.30	9.253	5 22 20.1	58.26	16 8.97	65.05	11 17.94	0.601
Wed.	7	23 13 37.18	9.237	4 58 59.7	+58.43	16 8.70	65.00	11 3.30	0.617
Thur.	8	23 17 18.70	9.222	4 35 35.4	58.59	16 8.44	64 94	10 48.30	0.632
Frid.	9	23 20 59.87	9.208	4 12 7.6	58.73	16 8.17	64.89	10 32.97	0.646
Sat.	10	23 24 40.71	9.195	3 48 36.5	+58.85	16 7.91	64.84	10 17.31	0.659
SUN.	11	23 28 21.23	9.182	3 25 2.6	58.96	16 7.64	64.80	10 1.31	0.672
Mon.	12	23 32 1.46	9.170	3 1 26.2	59.05	16 7.38	64.75	9 45.02	0.684
Tues.	13	23 35 41.41	9.159	2 37 47.8	+59.13	16 7.11	64.71	9 28.46	0.695
Wed.	14	23 39 21.09	9.148	2 14 7.7	59.19	16 6.85	64.67	9 11.64	0.706
Thur.	15	23 43 0.52	9.139	1 50 26.5	59.24	16 6.58	64.64	8 54.57	0.715
Frid.	16	23 46 39.72	9.130	1 26 44.5	+59.27	16 6.31	64.61	8 37.27	0.724
Sat.	17	23 50 18.71	9.121	1 3 2.0	59.28	16 6.04	64.58	8 19.75	0.733
SUN.	18	23 53 57.51	9.113	0 39 19.3	59.27	16 5.78	64.56	8 2.05	0.741
Mon.	19	23 57 36.13	9.106	S. 0 15 36.9	+59.25	16 5.51	64.54	7 44.17	0.748
Tues.	20	0 1 14.59	9.100	N. 0 8 4.8	59.22	16 5.24	64.52	7 26.12	0.754
Wed.	21	0 4 52.91	9.094	0 31 45.4	59.17	16 4.97	64.50	7 7.94	0.760
Thur.	22	0 8 31.12	9.090	0 55 24.7	+59.11	16 4.70	64.49	6 49.65	0.764
Frid.	23	0 12 9.24	9.087	1 19 2.3	59.03	16 4.43	64.48	6 31.28	0.767
Sat.	24	0 15 47.30	9.085	1 42 37.8	58.93	16 4.16	64.47	6 12.83	0.769
SUN.	25	0 19 25.31	9.083	2 6 10.8	+58.82	16 3.89	64.47	5 54.32	0.771
Mon.	26	0 23 3.29	9.083	2 29 41.0	58.70	16 3.62	64.47	5 35 79	0.771
Tues.	27	0 26 41.27	9.083	2 53 8.1	58.56	16 3.34	64.47	5 17.27	0.771
Wed.	28	0 30 19.27	9.085	3 16 31.8	+58.41	16 3.06	64.47	4 58.78	0.769
Thur.	29	0 33 57.32	9.087	3 39 51.6	58.25	16 2.78	64.48	4 40 34	0.767
Frid.	30	0 37 35.44	9.090	4 3 7.4	58.07	16 2.50	64.49	4 21.96	0.764
Sat.	31	0 41 13.66	9.094	4 26 18.8	57.88	16 2.22	64.51	4 3.67	0.760
SUN.	32	0 44 51 99	9.100	N. 4 49 25.4	+57.67	16 1.94	64.52	3 45.50	0.754

NOTE.—The mean time of semidiameter passing may be found by subtracting 0s.18 from the sidereal time.
The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing; north declinations, increasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Equation of Time, to be Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	m s	s	h m s
Thur.	1	22 51 17.82	9.345	S. 7 18 0.7	+57.16	12 25.07	0.511	22 38 52.75
Frid.	2	22 55 1.85	9.325	6 55 5.8	57.41	12 12.55	0.531	22 42 49.30
Sat.	3	22 58 45.42	9.306	6 32 5.0	57.65	11 59.56	0.550	22 46 45.86
SUN.	4	23 2 28.54	9.288	6 8 58.7	+57.87	11 46.13	0.568	22 50 42.41
Mon.	5	23 6 11.25	9.271	5 45 47.3	58.08	11 32.29	0.585	22 54 38.96
Tues.	6	23 9 53.56	9.255	5 22 31.1	58.27	11 18.05	0.601	22 58 35.51
Wed.	7	23 13 35.48	9.239	4 59 10.5	+58.44	11 3.41	0.617	23 2 32.07
Thur.	8	23 17 17.04	9.224	4 35 46.0	58.60	10 48.42	0.632	23 6 28.62
Frid.	9	23 20 58.25	9.210	4 12 17.9	58.74	10 33.08	0.646	23 10 25.17
Sat.	10	23 24 39.13	9.197	3 48 46.6	+58.86	10 17.41	0.659	23 14 21.72
SUN.	11	23 28 19.69	9.184	3 25 12.4	58.97	10 1.41	0.672	23 18 18.28
Mon.	12	23 31 59.96	9.172	3 1 35.8	59.06	9 45.13	0.684	23 22 14.83
Tues.	13	23 35 39.95	9.161	2 37 57.1	+59.14	9 28.57	0.695	23 26 11.38
Wed.	14	23 39 19.68	9.150	2 14 16.8	59.20	9 11.75	0.706	23 30 7.93
Thur.	15	23 42 59.16	9.141	1 50 35.3	59.25	8 54.68	0.715	23 34 4.48
Frid.	16	23 46 38.41	9.132	1 26 53.0	+59.28	8 37.38	0.724	23 38 1.03
Sat.	17	23 50 17.44	9.123	1 3 10.2	59.29	8 19.85	0.733	23 41 57.59
SUN.	18	23 53 56.28	9.115	0 39 27.2	59.28	8 2.14	0.741	23 45 54.14
Mon.	19	23 57 34 95	9.108	S. 0 15 44.5	+59.26	7 44.26	0.748	23 49 50.69
Tues.	20	0 1 13.46	9.102	N. 0 7 57.5	59.23	7 26.22	0.754	23 53 47.24
Wed.	21	0 4 51.83	9.096	0 31 38.4	59.18	7 8.03	0.760	23 57 43.80
Thur.	22	0 8 30.09	9.092	0 55 18.0	+59.12	6 49.74	0.764	0 1 40.35
Frid.	23	0 12 8.26	9.089	1 18 55.9	59.04	6 31.36	0.767	0 5 36.90
Sat.	24	0 15 46.36	9.087	1 42 31.7	58.94	6 12.91	0.769	0 9 33.45
SUN.	25	0 19 24.41	9.085	2 6 5.0	+58.83	5 54.40	0.771	0 13 30.01
Mon.	26	0 23 2.43	9.085	2 29 35.5	58.71	5 35.87	0.771	0 17 26.56
Tues.	27	0 26 40.46	9.085	2 53 2.9	58.57	5 17.35	0.771	0 21 23.11
Wed.	28	0 30 18.51	9.087	3 16 26.9	+58.42	4 58.85	0.769	0 25 19.66
Thur.	29	0 33 56.61	9.089	3 39 47.1	58.26	4 40.40	0.767	0 29 16.21
Frid.	30	0 37 34.78	9.092	4 3 3.2	58.08	4 22.02	0.764	0 33 12.76
Sat.	31	0 41 13 04	9.096	4 26 14.9	57.89	4 3.72	0.760	0 37 9.32
SUN.	32	0 44 51.42	9.102	N. 4 49 21.8	+57.68	3 45.55	0.754	0 41 5.87

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing; north declinations, increasing.

Diff. for 1 hour, +9s.8565. (Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S TRUE LONGITUDE. λ	THE SUN'S TRUE LONGITUDE. λ'	Diff. for 1 Hour.	THE SUN'S LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		° ′ ″	′ ″	″	″			h m s
1	61	341 23 9.9	23 14.7	150.32	+ 0.55	9.9962904	+46.5	1 20 53.96
2	62	342 23 16.8	23 21.5	150.25	0.57	9.9964029	47.1	1 16 58.05
3	63	343 23 22.1	23 26.7	150.18	0.55	9.9965168	47.7	1 13 2.14
4	64	344 23 25.8	23 30.3	150.12	+ 0.51	9.9966320	+48.2	1 9 6.23
5	65	345 23 28.0	23 32.4	150.05	0.43	9.9967483	48.7	1 5 10.33
6	66	346 23 28.5	23 32.8	149.98	0.34	9.9968656	49.0	1 1 14.42
7	67	347 23 27.4	23 31.6	149.91	+ 0.23	9.9969836	+49.3	0 57 18.51
8	68	348 23 24.6	23 28.7	149.85	+ 0.10	9.9971022	49.5	0 53 22.61
9	69	349 23 20.2	23 24.2	149.78	− 0.05	9.9972212	49.6	0 49 26.71
10	70	350 23 14.1	23 18.0	149.71	− 0.18	9.9973404	+49.7	0 45 30.80
11	71	351 23 6.1	23 10.0	149.63	0.31	9.9974598	49.8	0 41 34.89
12	72	352 22 56.2	23 0.0	149.55	0.43	9.9975794	49.9	0 37 38.98
13	73	353 22 44.3	22 48.0	149.47	− 0.53	9.9976991	+49.9	0 33 43 08
14	74	354 22 30.4	22 34.0	149.38	0.60	9.9978188	49.9	0 29 47.17
15	75	355 22 14.5	22 18.0	149.29	0.65	9.9979385	49.9	0 25 51.26
16	76	356 21 56.4	21 59.9	149.19	− 0.66	9.9980583	+49.9	0 21 55.35
17	77	357 21 36.1	21 39.5	149.10	0.65	9.9981782	50.0	0 17 59.45
18	78	358 21 13.5	21 16.8	149.01	0.60	9.9982982	50.1	0 14 3.54
19	79	359 20 48.6	20 51.8	148.92	− 0.52	9.9984183	+50.2	0 10 7.63
20	80	0 20 21.4	20 24.5	148.82	0.42	9.9985387	50.3	0 6 11.73
21	81	1 19 51.8	19 54.9	148.73	0.31	9.9986595	50.5	{ 0 2 15.83 / 23 58 19.92 }
22	82	2 19 19.9	19 22.9	148.63	− 0.19	9.9987809	+50.7	23 54 24.01
23	83	3 18 45.8	18 48.7	148.54	− 0.06	9.9989029	51.0	23 50 28.11
24	84	4 18 9.5	18 12.3	148.44	+ 0.07	9.9990255	51.2	23 46 32.21
25	85	5 17 30.9	17 33.6	148.35	+ 0.18	9.9991488	+51.5	23 42 36.30
26	86	6 16 50.1	16 52.7	148.25	0.29	9.9992728	51.8	23 38 40.39
27	87	7 16 7.1	16 9.7	148.16	0.36	9.9993975	52.1	23 34 44.48
28	88	8 15 22.1	15 24.6	148.08	+ 0.42	9.9995230	+52.4	23 30 48.58
29	89	9 14 35.1	14 37.5	148.00	0.45	9.9996492	52.7	23 26 52.67
30	90	10 13 46.3	13 48.6	147.92	0.45	9.9997759	52.9	23 22 56.76
31	91	11 12 55.5	12 57.7	147.84	0.41	9.9999031	53.1	23 19 0.86
32	92	12 12 2.8	12 4.9	147.77	+ 0.34	0.0000307	+53.2	23 15 4.96

NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ', to the mean equinox of January $0^d.0$.

Diff. for 1 Hour, $-9^s.8296$. (Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	16 28.0	16 26.1	60 19.3	−0.45	60 12.3	−0.70	15 25.3	2.24	18.5
2	16 23.4	16 20.1	60 2.4	0.92	59 50.2	1.10	16 19.3	2.27	19.5
3	16 16.2	16 11.9	59 36.0	1.25	59 20.3	1.36	17 14.2	2.31	20.5
4	16 7.4	16 2 6	59 3.5	−1.43	58 46.0	−1.48	18 9.9	2.33	21.5
5	15 57.7	15 52.8	58 28.1	1.50	58 10.0	1.50	19 5.8	2.32	22.5
6	15 47.9	15 43.0	57 52.0	1.49	57 34.2	1.47	20 1.2	2.28	23.5
7	15 38.3	15 33.7	57 16.8	−1.43	56 59.9	−1.39	20 55.1	2.21	24.5
8	15 29.2	15 24.9	56 43.5	1.35	56 27.6	1.30	21 46.9	2.11	25 5
9	15 20.7	15 16.7	56 12.3	1.25	55 57.6	1.20	22 36.2	2.00	26.5
10	15 12.9	15 9.2	55 43.4	−1.15	55 29.9	−1.10	23 23.1	1.91	27.5
11	15 5.7	15 2.4	55 17.0	1.05	55 4.8	0.99	δ		28.5
12	14 59 2	14 56.3	54 53.3	0.92	54 42.7	0.85	0 7.9	1.83	29.5
13	14 53.7	14 51.3	54 33.0	−0.77	54 24.3	−0.67	0 51.1	1.78	0.2
14	14 49.3	14 47 6	54 16.9	0.57	54 10.7	0.45	1 33.4	1.75	1.2
15	14 46.4	14 45.5	54 6.0	0.33	54 2.9	−0.18	2 15.5	1.76	2.2
16	14 45.2	14 45.3	54 1.6	−0.03	54 2.2	+0.14	2 57.9	1.79	3.2
17	14 46.1	14 47.4	54 4.9	+0.32	54 9.8	0.50	3 41.4	1.85	4.2
18	14 49.3	14 52.0	54 17.0	0.70	54 26.6	0.90	4 26.4	1.91	5.2
19	14 55.2	14 59.1	54 38.6	+1.10	54 53.0	+1.31	5 13.3	2.00	6.2
20	15 3.7	15 9.0	55 9.9	1.51	55 29.2	1.70	6 2.3	2.09	7.2
21	15 14.9	15 21.3	55 50.7	1.88	56 14.4	2.05	6 53.3	2.16	8.2
22	15 28.2	15 35.6	56 39.8	+2.18	57 6.7	+2.29	7 46.0	2.22	9.2
23	15 43.2	15 51.0	57 34.8	2.37	58 3.5	2.40	8 39.7	2.25	10.2
24	15 58.9	16 6.5	58 32.3	2.38	59 0.5	2.30	9 33.9	2.26	11.2
25	16 13.9	16 20.7	59 27.5	+2.17	59 52.5	+1.98	10 28.2	2.26	12.2
26	16 26.8	16 32.0	60 15.0	1.74	60 31.2	1.44	11 22.4	2.26	13.2
27	16 36.2	16 39.2	60 49.6	1.10	61 0.6	+0.73	12 16.8	2.27	14.2
28	16 41.0	16 41.5	61 7.1	+0.35	61 8.9	−0.05	13 11.6	2.30	15.2
29	16 40.7	16 38.7	61 5.9	−0.43	60 58.5	0.79	14 7.4	2.34	16.2
30	16 35.5	16 31.4	60 47.0	1.12	60 31.7	1.40	15 1.1	2.39	17.2
31	16 26.4	16 20.7	60 13.4	1.63	59 52.6	1.81	16 1.7	2.41	18.2
32	16 14.5	16 8.0	59 29.9	−1.94	59 6.0	−2.02	16 59.5	2.40	19.2

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	THURSDAY 1.			
	h m s	s	° ′ ″	″
0	13 30 57.55	2.3101	S. 4 9 55.3	12.664
1	13 33 16.17	2.3106	4 22 34.3	12.634
2	13 35 34.82	2.3112	4 35 11.4	12.602
3	13 37 53.51	2.3117	4 47 46.6	12.570
4	13 40 12.23	2.3123	5 0 19.8	12.536
5	13 42 30.99	2.3129	5 12 50.9	12.500
6	13 44 49.78	2.3135	5 25 19.8	12.463
7	13 47 8.61	2.3142	5 37 46.5	12.425
8	13 49 27.49	2.3150	5 50 10.8	12.385
9	13 51 46.41	2.3157	6 2 32.7	12.344
10	13 54 5.37	2.3164	6 14 52.1	12.302
11	13 56 24.38	2.3172	6 27 8.9	12.257
12	13 58 43.44	2.3181	6 39 22.9	12.211
13	14 1 2.55	2.3189	6 51 34.2	12.165
14	14 3 21.71	2.3198	7 3 42.7	12.117
15	14 5 40.92	2.3207	7 15 48.2	12.067
16	14 8 0.19	2.3217	7 27 50.7	12.017
17	14 10 19.52	2.3226	7 39 50.2	11.965
18	14 12 38.90	2.3235	7 51 46.5	11.912
19	14 14 58.34	2.3246	8 3 39.6	11.857
20	14 17 17.85	2.3257	8 15 29.4	11.801
21	14 19 37.42	2.3267	8 27 15.7	11.742
22	14 21 57.05	2.3277	8 38 58.5	11.684
23	14 24 16.75	2.3288	S. 8 50 37.8	11.626
	FRIDAY 2.			
0	14 26 36.51	2.3299	S. 9 2 13.6	11.565
1	14 28 56.34	2.3311	9 13 45.6	11.502
2	14 31 16.24	2.3322	9 25 13.8	11.438
3	14 33 36.21	2.3334	9 36 38.2	11.373
4	14 35 56.25	2.3346	9 47 58.6	11.307
5	14 38 16.36	2.3358	9 59 15.0	11.240
6	14 40 36.55	2.3371	10 10 27.4	11.172
7	14 42 56.81	2.3383	10 21 35.6	11.102
8	14 45 17.15	2.3396	10 32 39.6	11.031
9	14 47 37.56	2.3408	10 43 39.3	10.959
10	14 49 58.05	2.3421	10 54 34.7	10.886
11	14 52 18.62	2.3434	11 5 25.6	10.811
12	14 54 39.26	2.3447	11 16 12.0	10.736
13	14 56 59.98	2.3461	11 26 53.9	10.659
14	14 59 20.79	2.3475	11 37 31.1	10.581
15	15 1 41.68	2.3488	11 48 3.6	10.502
16	15 4 2.65	2.3502	11 58 31.3	10.422
17	15 6 23.70	2.3515	12 8 54.2	10.341
18	15 8 44.83	2.3529	12 19 12.2	10.259
19	15 11 6.05	2.3543	12 29 25.3	10.176
20	15 13 27.35	2.3557	12 39 33.3	10.091
21	15 15 48.73	2.3571	12 49 36.2	10.005
22	15 18 10.20	2.3585	12 59 33.9	9.918
23	15 20 31.75	2.3598	13 9 26.4	9.832
24	15 22 53.38	2.3612	S. 13 19 13.7	9.743

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY 3.			
	h m s	s	° ′ ″	″
0	15 22 53.38	2.3612	S. 13 19 13.7	9.743
1	15 25 15.10	2.3626	13 28 55.6	9.653
2	15 27 36.90	2.3640	13 38 32.1	9.562
3	15 29 58.78	2.3654	13 48 3.1	9.471
4	15 32 20.75	2.3668	13 57 28.6	9.379
5	15 34 42.80	2.3682	14 6 48.6	9.286
6	15 37 4.93	2.3696	14 16 2.9	9.191
7	15 39 27.15	2.3710	14 25 11.5	9.096
8	15 41 49.45	2.3723	14 34 14.4	9.000
9	15 44 11.83	2.3737	14 43 11.5	8.902
10	15 46 34.29	2.3750	14 52 2.7	8.804
11	15 48 56.83	2.3763	15 0 48.0	8.706
12	15 51 19.45	2.3777	15 9 27.4	8.607
13	15 53 42.15	2.3790	15 18 0.8	8.506
14	15 56 4.93	2.3802	15 26 28.1	8.403
15	15 58 27.78	2.3815	15 34 49.2	8.301
16	16 0 50.71	2.3828	15 43 4.2	8.198
17	16 3 13.72	2.3841	15 51 13.0	8.094
18	16 5 36.80	2.3853	15 59 15.5	7.989
19	16 7 59.95	2.3865	16 7 11.7	7.884
20	16 10 23.18	2.3877	16 15 1.6	7.778
21	16 12 46.48	2.3889	16 22 45.1	7.671
22	16 15 9.85	2.3900	16 30 22.1	7.562
23	16 17 33.28	2.3911	S. 16 37 52.6	7.455
	SUNDAY 4.			
0	16 19 56.78	2.3922	S. 16 45 16.7	7.347
1	16 22 20.35	2.3933	16 52 34.2	7.236
2	16 24 43.98	2.3943	16 59 45.0	7.125
3	16 27 7.67	2.3953	17 6 49.2	7.014
4	16 29 31.42	2.3963	17 13 46.7	6.902
5	16 31 55.23	2.3973	17 20 37.5	6.791
6	16 34 19.10	2.3982	17 27 21.6	6.678
7	16 36 43.02	2.3991	17 33 58.9	6.564
8	16 39 6.99	2.4000	17 40 29.3	6.449
9	16 41 31.02	2.4009	17 46 52.8	6.334
10	16 43 55.10	2.4017	17 53 9.4	6.219
11	16 46 19.22	2.4024	17 59 19.1	6.103
12	16 48 43.38	2.4031	18 5 21.8	5.987
13	16 51 7.59	2.4038	18 11 17.5	5.870
14	16 53 31.84	2.4044	18 17 6.2	5.753
15	16 55 56.12	2.4050	18 22 47.9	5.636
16	16 58 20.44	2.4056	18 28 22.5	5.517
17	17 0 44.79	2.4062	18 33 49.9	5.397
18	17 3 9.18	2.4066	18 39 10.2	5.278
19	17 5 33.59	2.4070	18 44 23.3	5.159
20	17 7 58.02	2.4074	18 49 29.3	5.040
21	17 10 22.48	2.4078	18 54 28.1	4.919
22	17 12 46.96	2.4081	18 59 19.6	4.798
23	17 15 11.45	2.4083	19 4 3.9	4.677
24	17 17 35.95	2.4085	S. 19 8 40.9	4.556

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

MONDAY 5.

Hour	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	17 17 35.95	2.4085	S. 19 8 40.9	4.556
1	17 20 0.47	2.4087	19 13 10.6	4.434
2	17 22 24.99	2.4088	19 17 33.0	4.312
3	17 24 49.52	2.4088	19 21 48.1	4.191
4	17 27 14.05	2.4088	19 25 55.9	4.068
5	17 29 38.58	2.4088	19 29 56.3	3.945
6	17 32 3.11	2.4087	19 33 49.3	3.822
7	17 34 27.63	2.4086	19 37 34.9	3.698
8	17 36 52.14	2.4084	19 41 13.1	3.576
9	17 39 16.63	2.4081	19 44 44.0	3.452
10	17 41 41.11	2.4077	19 48 7.4	3.328
11	17 44 5.56	2.4073	19 51 23.4	3.204
12	17 46 29.99	2.4069	19 54 31.9	3.080
13	17 48 54.39	2.4065	19 57 33.0	2.957
14	17 51 18.77	2.4061	20 0 26.7	2.832
15	17 53 43.12	2.4055	20 3 12.9	2.708
16	17 56 7.43	2.4048	20 5 51.7	2.584
17	17 58 31.69	2.4040	20 8 23.0	2.459
18	18 0 55.91	2.4033	20 10 46.8	2.335
19	18 3 20.09	2.4026	20 13 3.2	2.211
20	18 5 44.22	2.4017	20 15 12.1	2.086
21	18 8 8.29	2.4007	20 17 13.5	1.962
22	18 10 32.30	2.3997	20 19 7.5	1.837
23	18 12 56.25	2.3987	S. 20 20 54.0	1.712

TUESDAY 6.

0	18 15 20.14	2.3976	S. 20 22 33.0	1.588
1	18 17 43.96	2.3964	20 24 4.6	1.465
2	18 20 7.71	2.3952	20 25 28.8	1.341
3	18 22 31.39	2.3940	20 26 45.5	1.217
4	18 24 54.99	2.3926	20 27 54.8	1.093
5	18 27 18.50	2.3912	20 28 56.7	0.969
6	18 29 41.93	2.3897	20 29 51.1	0.845
7	18 32 5.27	2.3882	20 30 38.1	0.722
8	18 34 28.52	2.3867	20 31 17.8	0.600
9	18 36 51.67	2.3850	20 31 50.1	0.477
10	18 39 14.72	2.3833	20 32 15.0	0.354
11	18 41 37.67	2.3816	20 32 32.6	0.232
12	18 44 0.52	2.3799	20 32 42.8	− 0.109
13	18 46 23.26	2.3780	20 32 45.7	+ 0.012
14	18 48 45.88	2.3761	20 32 41.3	0.134
15	18 51 8.39	2.3742	20 32 29.6	0.255
16	18 53 30.78	2.3721	20 32 10.7	0.376
17	18 55 53.04	2.3700	20 31 44.5	0.497
18	18 58 15.18	2.3679	20 31 11.1	0.617
19	19 0 37.19	2.3657	20 30 30.5	0.737
20	19 2 59.07	2.3635	20 29 42.7	0.856
21	19 5 20.81	2.3612	20 28 47.8	0.975
22	19 7 42.41	2.3588	20 27 45.7	1.095
23	19 10 3.87	2.3564	20 26 36.4	1.214
24	19 12 25.18	2.3540	S. 20 25 20.0	1.332

WEDNESDAY 7.

Hour	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	19 12 25.18	2.3540	S. 20 25 20.0	1.332
1	19 14 46.35	2.3515	20 23 56.6	1.448
2	19 17 7.36	2.3489	20 22 26.2	1.565
3	19 19 28.22	2.3463	20 20 48.8	1.682
4	19 21 48.92	2.3437	20 19 4.4	1.798
5	19 24 9.46	2.3410	20 17 13.0	1.914
6	19 26 29.84	2.3382	20 15 14.7	2.029
7	19 28 50.05	2.3354	20 13 9.5	2.143
8	19 31 10.09	2.3327	20 10 57.5	2.257
9	19 33 29.97	2.3298	20 8 38.6	2.372
10	19 35 49.67	2.3268	20 6 12.9	2.484
11	19 38 9.19	2.3238	20 3 40.5	2.597
12	19 40 28.53	2.3207	20 1 1.3	2.709
13	19 42 47.68	2.3177	19 58 15.4	2.820
14	19 45 6.65	2.3147	19 55 22.9	2.930
15	19 47 25.44	2.3116	19 52 23.8	3.040
16	19 49 44.04	2.3084	19 49 18.1	3.150
17	19 52 2.44	2.3051	19 46 5.8	3.259
18	19 54 20.65	2.3018	19 42 47.0	3.367
19	19 56 38.66	2.2985	19 39 21.7	3.476
20	19 58 56.47	2.2952	19 35 49.9	3.582
21	20 1 14.09	2.2919	19 32 11.8	3.687
22	20 3 31.50	2.2885	19 28 27.4	3.792
23	20 5 48.71	2.2851	S. 19 24 36.7	3.897

THURSDAY 8.

0	20 8 5.71	2.2816	S. 19 20 39.7	4.002
1	20 10 22.50	2.2781	19 16 36.4	4.106
2	20 12 39.08	2.2746	19 12 27.0	4.208
3	20 14 55.45	2.2710	19 8 11.4	4.311
4	20 17 11.60	2.2673	19 3 49.7	4.412
5	20 19 27.53	2.2637	18 59 22.0	4.512
6	20 21 43.25	2.2602	18 54 48.2	4.613
7	20 23 58.75	2.2565	18 50 8.4	4.712
8	20 26 14.03	2.2528	18 45 22.7	4.810
9	20 28 29.09	2.2491	18 40 31.2	4.907
10	20 30 43.92	2.2453	18 35 33.8	5.004
11	20 32 58.53	2.2416	18 30 30.7	5.100
12	20 35 12.91	2.2378	18 25 21.8	5.196
13	20 37 27.06	2.2340	18 20 7.2	5.290
14	20 39 40.99	2.2302	18 14 47.0	5.384
15	20 41 54.69	2.2264	18 9 21.1	5.477
16	20 44 8.16	2.2226	18 3 49.7	5.569
17	20 46 21.40	2.2187	17 58 12.8	5.661
18	20 48 34.40	2.2148	17 52 30.4	5.752
19	20 50 47.17	2.2109	17 46 42.6	5.841
20	20 52 59.71	2.2071	17 40 49.5	5.930
21	20 55 12.02	2.2032	17 34 51.0	6.019
22	20 57 24.09	2.1992	17 28 47.2	6.106
23	20 59 35.92	2.1952	17 22 38.3	6.192
24	21 1 47.52	2.1913	S. 17 16 24.2	6.277

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
FRIDAY 9.				
0	21 1 47.52	2.1913	S. 17 16 24.2	6.277
1	21 3 58.88	2.1873	17 10 5.0	6.362
2	21 6 10.00	2.1834	17 3 40.7	6.447
3	21 8 20.89	2.1795	16 57 11.4	6.530
4	21 10 31.54	2.1755	16 50 37.1	6.612
5	21 12 41.95	2.1716	16 43 58.0	6.693
6	21 14 52.13	2.1677	16 37 14.0	6.773
7	21 17 2.07	2.1637	16 30 25.2	6.853
8	21 19 11.77	2.1597	16 23 31.6	6.933
9	21 21 21.23	2.1557	16 16 33.3	7.011
10	21 23 30.45	2.1517	16 9 30.3	7.087
11	21 25 39.43	2.1477	16 2 22.8	7.163
12	21 27 48.18	2.1438	15 55 10.7	7.239
13	21 29 56.69	2.1398	15 47 54.1	7.313
14	21 32 4.96	2.1359	15 40 33.1	7.387
15	21 34 13.00	2.1320	15 33 7.6	7.461
16	21 36 20.80	2.1280	15 25 37.8	7.532
17	21 38 28.36	2.1241	15 18 3.8	7.603
18	21 40 35.69	2.1202	15 10 25.5	7.673
19	21 42 42.78	2.1163	15 2 43.0	7.742
20	21 44 49.64	2.1124	14 54 56.4	7.811
21	21 46 56.27	2.1085	14 47 5.7	7.878
22	21 49 2.66	2.1046	14 39 11.0	7.945
23	21 51 8.82	2.1007	S. 14 31 12.3	8.012
SATURDAY 10.				
0	21 53 14.75	2.0969	S. 14 23 9.6	8.077
1	21 55 20.45	2.0931	14 15 3.1	8.140
2	21 57 25.92	2.0893	14 6 52.8	8.203
3	21 59 31.16	2.0854	13 58 38.7	8.266
4	22 1 36.17	2.0816	13 50 20.9	8.327
5	22 3 40.95	2.0778	13 41 59.5	8.388
6	22 5 45.51	2.0741	13 33 34.4	8.448
7	22 7 49.84	2.0704	13 25 5.7	8.506
8	22 9 53.95	2.0667	13 16 33.6	8.563
9	22 11 57.84	2.0630	13 7 58.1	8.620
10	22 14 1.51	2.0593	12 59 19.2	8.677
11	22 16 4.96	2.0557	12 50 36.9	8.733
12	22 18 8.19	2.0520	12 41 51.3	8.788
13	22 20 11.20	2.0484	12 33 2.4	8.841
14	22 22 14.00	2.0448	12 24 10.4	8.893
15	22 24 16.58	2.0412	12 15 15.3	8.944
16	22 26 18.95	2.0377	12 6 17.1	8.996
17	22 28 21.11	2.0342	11 57 15.8	9.047
18	22 30 23.06	2.0307	11 48 11.5	9.096
19	22 32 24.80	2.0272	11 39 4.3	9.144
20	22 34 26.33	2.0238	11 29 54.2	9.192
21	22 36 27.66	2.0205	11 20 41.3	9.238
22	22 38 28.79	2.0171	11 11 25.6	9.284
23	22 40 29.72	2.0137	11 2 7.2	9.329
24	22 42 30.44	2.0103	S. 10 52 46.1	9.373

Hour	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
SUNDAY 11.				
0	22 42 30.44	2.0103	S. 10 52 46.1	9.373
1	22 44 30.96	2.0071	10 43 22.4	9.417
2	22 46 31.29	2.0039	10 33 56.1	9.460
3	22 48 31.43	2.0007	10 24 27.2	9.502
4	22 50 31.37	1.9974	10 14 55.9	9.542
5	22 52 31.12	1.9942	10 5 22.2	9.582
6	22 54 30.68	1.9911	9 55 46.1	9.621
7	22 56 30.05	1.9880	9 46 7.7	9.659
8	22 58 29.24	1.9850	9 36 27.0	9.697
9	23 0 28.25	1.9819	9 26 44.1	9.734
10	23 2 27.07	1.9789	9 16 59.0	9.770
11	23 4 25.72	1.9760	9 7 11.7	9.805
12	23 6 24.19	1.9730	8 57 22.4	9.839
13	23 8 22.48	1.9701	8 47 31.1	9.872
14	23 10 20.60	1.9672	8 37 37.8	9.905
15	23 12 18.55	1.9644	8 27 42.5	9.937
16	23 14 16.33	1.9616	8 17 45.3	9.968
17	23 16 13.94	1.9588	8 7 46.3	9.998
18	23 18 11.39	1.9561	7 57 45.6	10.027
19	23 20 8.67	1.9534	7 47 43.1	10.056
20	23 22 5.79	1.9507	7 37 38.9	10.084
21	23 24 2.76	1.9481	7 27 33.0	10.112
22	23 25 59.57	1.9456	7 17 25.5	10.138
23	23 27 56.23	1.9430	S. 7 7 16.5	10.163
MONDAY 12.				
0	23 29 52.73	1.9401	S. 6 57 6.0	10.187
1	23 31 49.08	1.9380	6 46 54.1	10.211
2	23 33 45.29	1.9356	6 36 40.7	10.235
3	23 35 41.36	1.9332	6 26 25.9	10.257
4	23 37 37.28	1.9309	6 16 9.8	10.278
5	23 39 33.06	1.9286	6 5 52.5	10.298
6	23 41 28.71	1.9263	5 55 34.0	10.318
7	23 43 24.22	1.9241	5 45 14.3	10.337
8	23 45 19.60	1.9218	5 34 53.5	10.356
9	23 47 14.84	1.9197	5 24 31.6	10.374
10	23 49 9.96	1.9176	5 14 8.6	10.392
11	23 51 4.95	1.9155	5 3 44.6	10.408
12	23 52 59.82	1.9135	4 53 19.6	10.424
13	23 54 54.57	1.9115	4 42 53.7	10.438
14	23 56 49.20	1.9096	4 32 27.0	10.452
15	23 58 43.72	1.9077	4 21 59.5	10.465
16	0 0 38.12	1.9058	4 11 31.2	10.478
17	0 2 32.41	1.9039	4 1 2.2	10.490
18	0 4 26.59	1.9022	3 50 32.4	10.502
19	0 6 20.67	1.9005	3 40 2.0	10.512
20	0 8 14.64	1.8987	3 29 31.0	10.521
21	0 10 8.51	1.8970	3 18 59.5	10.529
22	0 12 2.28	1.8954	3 8 27.5	10.538
23	0 13 55.96	1.8938	2 57 55.0	10.546
24	0 15 49.54	1.8922	S. 2 47 22.0	10.553

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

TUESDAY 13.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	0 15 49.54	1.8922	S. 2 47 22.0	10.553
1	0 17 43.03	1.8907	2 36 48.6	10.559
2	0 19 36.43	1.8893	2 26 14.9	10.564
3	0 21 29.75	1.8879	2 15 41.0	10.568
4	0 23 22.98	1.8866	2 5 6.8	10.572
5	0 25 16.14	1.8853	1 54 32.3	10.576
6	0 27 9.22	1.8840	1 43 57.6	10.579
7	0 29 2.22	1.8828	1 33 22.8	10.581
8	0 30 55.15	1.8816	1 22 47.9	10.582
9	0 32 48.01	1.8804	1 12 13.0	10.582
10	0 34 40.80	1.8793	1 1 38.1	10.582
11	0 36 33.52	1.8782	0 51 3.2	10.582
12	0 38 26.18	1.8772	0 40 28.3	10.580
13	0 40 18.78	1.8762	0 29 53.6	10.577
14	0 42 11.33	1.8753	0 19 19.0	10.575
15	0 44 3.82	1.8743	S. 0 8 44.6	10.572
16	0 45 56.25	1.8735	N. 0 1 49.6	10.568
17	0 47 48.64	1.8727	0 12 23.5	10.563
18	0 49 40.98	1.8720	0 22 57.1	10.558
19	0 51 33.28	1.8712	0 33 30.4	10.552
20	0 53 25.53	1.8705	0 44 3.3	10.544
21	0 55 17.74	1.8699	0 54 35.7	10.536
22	0 57 9.92	1.8693	1 5 7.6	10.528
23	0 59 2.06	1.8687	N. 1 15 39.0	10.519

WEDNESDAY 14.

0	1 0 54.17	1.8682	N. 1 26 9.9	10.510
1	1 2 46.25	1.8678	1 36 40.2	10.500
2	1 4 38.31	1.8674	1 47 9.9	10.489
3	1 6 30.34	1.8670	1 57 38.9	10.478
4	1 8 22.35	1.8667	2 8 7.2	10.466
5	1 10 14.34	1.8663	2 18 34.8	10.454
6	1 12 6.31	1.8661	2 29 1.7	10.441
7	1 13 58.27	1.8659	2 39 27.8	10.427
8	1 15 50.22	1.8658	2 49 53.0	10.412
9	1 17 42.17	1.8657	3 0 17.2	10.396
10	1 19 34.11	1.8656	3 10 40.5	10.381
11	1 21 26.04	1.8655	3 21 2.9	10.365
12	1 23 17.97	1.8656	3 31 24.3	10.348
13	1 25 9.91	1.8657	3 41 44.6	10.330
14	1 27 1.85	1.8657	3 52 3.9	10.312
15	1 28 53.79	1.8658	4 2 22.1	10.293
16	1 30 45.74	1.8660	4 12 39.1	10.273
17	1 32 37.71	1.8662	4 22 54.9	10.253
18	1 34 29.69	1.8665	4 33 9.5	10.233
19	1 36 21.69	1.8668	4 43 22.9	10.212
20	1 38 13.71	1.8672	4 53 35.0	10.190
21	1 40 5.75	1.8676	5 3 45.7	10.167
22	1 41 57.82	1.8680	5 13 55.0	10.143
23	1 43 49.91	1.8684	5 24 2.9	10.120
24	1 45 42.03	1.8690	N. 5 34 9.4	10.096

THURSDAY 15.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	1 45 42.03	1.8690	N. 5 34 9.4	10.096
1	1 47 34.19	1.8696	5 44 14.4	10.071
2	1 49 26.38	1.8701	5 54 17.9	10.046
3	1 51 18.60	1.8707	6 4 19.9	10.020
4	1 53 10.86	1.8714	6 14 20.3	9.993
5	1 55 3.17	1.8722	6 24 19.0	9.965
6	1 56 55.52	1.8729	6 34 16.1	9.937
7	1 58 47.92	1.8737	6 44 11.5	9.909
8	2 0 40.37	1.8746	6 54 5.2	9.880
9	2 2 32.87	1.8755	7 3 57.1	9.850
10	2 4 25.43	1.8764	7 13 47.2	9.819
11	2 6 18.04	1.8773	7 23 35.4	9.788
12	2 8 10.71	1.8784	7 33 21.8	9.757
13	2 10 3.45	1.8795	7 43 6.3	9.725
14	2 11 56.25	1.8805	7 52 48.8	9.693
15	2 13 49.11	1.8816	8 2 29.4	9.660
16	2 15 42.04	1.8828	8 12 8.0	9.626
17	2 17 35.05	1.8841	8 21 44.5	9.591
18	2 19 28.13	1.8853	8 31 18.9	9.556
19	2 21 21.29	1.8866	8 40 51.2	9.520
20	2 23 14.53	1.8879	8 50 21.3	9.483
21	2 25 7.84	1.8893	8 59 49.2	9.447
22	2 27 1.24	1.8907	9 9 14.9	9.410
23	2 28 54.72	1.8921	N. 9 18 38.4	9.372

FRIDAY 16.

0	2 30 48.29	1.8936	N. 9 27 59.6	9.334
1	2 32 41.95	1.8952	9 37 18.5	9.295
2	2 34 35.71	1.8967	9 46 35.0	9.255
3	2 36 29.56	1.8983	9 55 49.1	9.214
4	2 38 23.51	1.8999	10 5 0.7	9.173
5	2 40 17.55	1.9015	10 14 9.8	9.131
6	2 42 11.69	1.9033	10 23 16.4	9.089
7	2 44 5.94	1.9051	10 32 20.5	9.047
8	2 46 0.30	1.9068	10 41 22.0	9.004
9	2 47 54.76	1.9086	10 50 21.0	8.961
10	2 49 49.33	1.9105	10 59 17.3	8.916
11	2 51 44.02	1.9125	11 8 10.9	8.871
12	2 53 38.83	1.9144	11 17 1.8	8.825
13	2 55 33.75	1.9163	11 25 49.9	8.779
14	2 57 28.79	1.9182	11 34 35.2	8.733
15	2 59 23.94	1.9202	11 43 17.8	8.686
16	3 1 19.22	1.9224	11 51 57.5	8.637
17	3 3 14.63	1.9245	12 0 34.3	8.588
18	3 5 10.16	1.9266	12 9 8.1	8.539
19	3 7 5.82	1.9288	12 17 39.0	8.490
20	3 9 1.61	1.9310	12 26 6.9	8.440
21	3 10 57.54	1.9332	12 34 31.8	8.389
22	3 12 53.60	1.9355	12 42 53.6	8.337
23	3 14 49.80	1.9377	12 51 12.3	8.285
24	3 16 46.13	1.9400	N. 12 59 27.8	8.232

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY 17.			
	h m s	s	° ′ ″	″
0	3 16 46.13	1.9400	N.12 59 27.8	8.232
1	3 18 42.60	1.9424	13 7 40.1	8.179
2	3 20 39.22	1.9449	13 15 49.3	8.126
3	3 22 35.99	1.9473	13 23 55.3	8.072
4	3 24 32.90	1.9497	13 31 58.0	8.017
5	3 26 29.96	1.9522	13 39 57.3	7.961
6	3 28 27.16	1.9547	13 47 53.3	7.905
7	3 30 24.52	1.9572	13 55 45.9	7.848
8	3 32 22.03	1.9598	14 3 35.1	7.791
9	3 34 19.70	1.9625	14 11 20.8	7.733
10	3 36 17.53	1.9651	14 19 3.0	7.674
11	3 38 15.51	1.9677	14 26 41.7	7.615
12	3 40 13.65	1.9704	14 34 16.8	7.555
13	3 42 11.96	1.9731	14 41 48.3	7.495
14	3 44 10.43	1.9758	14 49 16.2	7.435
15	3 46 9.06	1.9786	14 56 40.5	7.373
16	3 48 7.86	1.9814	15 4 1.0	7.311
17	3 50 6.83	1.9842	15 11 17.8	7.248
18	3 52 5.97	1.9871	15 18 30.8	7.185
19	3 54 5.28	1.9899	15 25 40.0	7.121
20	3 56 4.76	1.9928	15 32 45.3	7.057
21	3 58 4.42	1.9957	15 39 46.8	6.992
22	4 0 4.25	1.9987	15 46 44.4	6.927
23	4 2 4.26	2.0016	N.15 53 38.0	6.860
	SUNDAY 18.			
0	4 4 4.44	2.0045	N.16 0 27.6	6.793
1	4 6 4.80	2.0075	16 7 13.2	6.726
2	4 8 5.34	2.0106	16 13 54.7	6.658
3	4 10 6.07	2.0137	16 20 32.1	6.589
4	4 12 6.98	2.0167	16 27 5.4	6.520
5	4 14 8.07	2.0197	16 33 34.5	6.450
6	4 16 9.35	2.0228	16 39 59.4	6.379
7	4 18 10.81	2.0259	16 46 20.0	6.308
8	4 20 12.46	2.0291	16 52 36.3	6.237
9	4 22 14.30	2.0322	16 58 48.4	6.165
10	4 24 16.33	2.0354	17 4 56.1	6.092
11	4 26 18.55	2.0385	17 10 59.4	6.018
12	4 28 20.95	2.0417	17 16 58.3	5.944
13	4 30 23.55	2.0449	17 22 52.7	5.869
14	4 32 26.34	2.0482	17 28 42.6	5.794
15	4 34 29.33	2.0514	17 34 28.0	5.718
16	4 36 32.51	2.0546	17 40 8.8	5.642
17	4 38 35.88	2.0578	17 45 45.0	5.565
18	4 40 39.45	2.0611	17 51 16.6	5.487
19	4 42 43.22	2.0644	17 56 43.5	5.409
20	4 44 47.18	2.0677	18 2 5.7	5.330
21	4 46 51.34	2.0710	18 7 23.1	5.251
22	4 48 55.70	2.0743	18 12 35.8	5.171
23	4 51 0.26	2.0777	18 17 43.6	5.090
24	4 53 5.02	2.0810	N.18 22 46.6	5.009

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	MONDAY 19.			
	h m s	s	° ′ ″	″
0	4 53 5.02	2.0810	N.18 22 46.6	5.009
1	4 55 9.98	2.0843	18 27 44.7	4.927
2	4 57 15.14	2.0876	18 32 37.8	4.844
3	4 59 20.49	2.0909	18 37 26.0	4.761
4	5 1 26.04	2.0943	18 42 9.2	4.677
5	5 3 31.80	2.0976	18 46 47.3	4.593
6	5 5 37.75	2.1009	18 51 20.4	4.509
7	5 7 43.90	2.1043	18 55 48.4	4.423
8	5 9 50.26	2.1077	19 0 11.2	4.337
9	5 11 56.82	2.1110	19 4 28.8	4.250
10	5 14 3.58	2.1143	19 8 41.2	4.163
11	5 16 10.54	2.1177	19 12 48.4	4.076
12	5 18 17.70	2.1210	19 16 50.3	3.987
13	5 20 25.06	2.1243	19 20 46.9	3.898
14	5 22 32.62	2.1277	19 24 38.1	3.808
15	5 24 40.39	2.1311	19 28 23.9	3.718
16	5 26 48.35	2.1344	19 32 4.3	3.628
17	5 28 56.51	2.1377	19 35 39.2	3.537
18	5 31 4.87	2.1410	19 39 8.7	3.445
19	5 33 13.43	2.1443	19 42 32.6	3.353
20	5 35 22.19	2.1476	19 45 51.0	3.260
21	5 37 31.14	2.1509	19 49 3.8	3.166
22	5 39 40.29	2.1542	19 52 10.9	3.072
23	5 41 49.64	2.1575	N.19 55 12.4	2.978
	TUESDAY 20.			
0	5 43 59.19	2.1607	N.19 58 8.2	2.883
1	5 46 8.93	2.1640	20 0 58.3	2.787
2	5 48 18.87	2.1672	20 3 42.6	2.690
3	5 50 29.00	2.1704	20 6 21.1	2.593
4	5 52 39.32	2.1737	20 8 53.8	2.496
5	5 54 49.84	2.1769	20 11 20.6	2.398
6	5 57 0.55	2.1801	20 13 41.5	2.299
7	5 59 11.45	2.1832	20 15 56.5	2.201
8	6 1 22.54	2.1864	20 18 5.6	2.102
9	6 3 33.82	2.1896	20 20 8.7	2.002
10	6 5 45.29	2.1927	20 22 5.8	1.901
11	6 7 56.94	2.1957	20 23 56.8	1.799
12	6 10 8.78	2.1988	20 25 41.7	1.697
13	6 12 20.80	2.2019	20 27 20.5	1.596
14	6 14 33.01	2.2050	20 28 53.2	1.494
15	6 16 45.40	2.2080	20 30 19.8	1.392
16	6 18 57.97	2.2110	20 31 40.2	1.288
17	6 21 10.72	2.2139	20 32 54.3	1.183
18	6 23 23.64	2.2168	20 34 2.1	1.079
19	6 25 36.74	2.2197	20 35 3.7	0.974
20	6 27 50.01	2.2227	20 35 59.0	0.868
21	6 30 3.46	2.2256	20 36 47.9	0.763
22	6 32 17.08	2.2284	20 37 30.5	0.657
23	6 34 30.87	2.2312	20 38 6.7	0.550
24	6 36 44.83	2.2340	N.20 38 36.5	0.442

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	WEDNESDAY 21.			
	h m s	s	° ′ ″	″
0	6 36 44.83	2.2340	N.20 38 36.5	0.442
1	6 38 58.95	2.2368	20 38 59.8	0.335
2	6 41 13.24	2.2396	20 39 16.7	0.227
3	6 43 27.70	2.2423	20 39 27.1	0.119
4	6 45 42.32	2.2449	20 39 31.0	+ 0.010
5	6 47 57.09	2.2475	20 39 28.3	− 0.099
6	6 50 12.02	2.2502	20 39 19.1	0.208
7	6 52 27.11	2.2528	20 39 3.3	0.318
8	6 54 42.35	2.2553	20 38 40.9	0.429
9	6 56 57.75	2.2579	20 38 11.8	0.540
10	6 59 13.30	2.2603	20 37 36.1	0.651
11	7 1 28.99	2.2627	20 36 53.7	0.762
12	7 3 44.82	2.2651	20 36 4.7	0.873
13	7 6 0.80	2.2675	20 35 9.0	0.985
14	7 8 16.92	2.2699	20 34 6.5	1.098
15	7 10 33.19	2.2722	20 32 57.2	1.211
16	7 12 49.59	2.2745	20 31 41.2	1.323
17	7 15 6.13	2.2767	20 30 18.4	1.436
18	7 17 22.80	2.2789	20 28 48.9	1.548
19	7 19 39.60	2.2811	20 27 12.6	1.662
20	7 21 56.53	2.2832	20 25 29.4	1.777
21	7 24 13.59	2.2853	20 23 39.3	1.891
22	7 26 30.77	2.2873	20 21 42.4	2.005
23	7 28 48.07	2.2894	N.20 19 38.7	2.119
	THURSDAY 22.			
0	7 31 5.50	2.2914	N.20 17 28.1	2.234
1	7 33 23.04	2.2933	20 15 10.6	2.349
2	7 35 40.70	2.2952	20 12 46.2	2.465
3	7 37 58.47	2.2971	20 10 14.8	2.581
4	7 40 16.35	2.2989	20 7 36.5	2.696
5	7 42 34.34	2.3007	20 4 51.3	2.811
6	7 44 52.44	2.3025	20 1 59.2	2.927
7	7 47 10.64	2.3042	19 59 0.1	3.043
8	7 49 28.94	2.3058	19 55 54.0	3.159
9	7 51 47.34	2.3075	19 52 41.0	3.275
10	7 54 5.84	2.3092	19 49 21.0	3.391
11	7 56 24.44	2.3107	19 45 54.0	3.507
12	7 58 43.13	2.3122	19 42 20.1	3.623
13	8 1 1.91	2.3137	19 38 39.2	3.740
14	8 3 20.77	2.3151	19 34 51.3	3.857
15	8 5 39.72	2.3165	19 30 56.4	3.973
16	8 7 58.75	2.3178	19 26 54.5	4.090
17	8 10 17.86	2.3192	19 22 45.6	4.206
18	8 12 37.05	2.3205	19 18 29.8	4.322
19	8 14 56.32	2.3217	19 14 7.0	4.438
20	8 17 15.66	2.3229	19 9 37.2	4.555
21	8 19 35.07	2.3241	19 5 0.4	4.671
22	8 21 54.55	2.3252	19 0 16.7	4.787
23	8 24 14.10	2.3263	18 55 26.0	4.903
24	8 26 33.71	2.3273	N.18 50 28.3	5.019

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	FRIDAY 23.			
	h m s	s	° ′ ″	″
0	8 26 33.71	2.3273	N.18 50 28.3	5.019
1	8 28 53.38	2.3283	18 45 23.7	5.134
2	8 31 13.11	2.3293	18 40 12.2	5.250
3	8 33 32.90	2.3303	18 34 53.7	5.366
4	8 35 52.75	2.3313	18 29 28.3	5.481
5	8 38 12.66	2.3322	18 23 56.0	5.596
6	8 40 32.62	2.3330	18 18 16.8	5.711
7	8 42 52.62	2.3338	18 12 30.7	5.825
8	8 45 12.67	2.3346	18 6 37.8	5.939
9	8 47 32.77	2.3353	18 0 38.0	6.053
10	8 49 52.91	2.3360	17 54 31.4	6.167
11	8 52 13.09	2.3366	17 48 17.9	6.281
12	8 54 33.30	2.3372	17 41 57.6	6.394
13	8 56 53.55	2.3378	17 35 30.6	6.507
14	8 59 13.84	2.3385	17 28 56.8	6.620
15	9 1 34.17	2.3391	17 22 16.2	6.732
16	9 3 54.53	2.3395	17 15 28.9	6.844
17	9 6 14.91	2.3399	17 8 34.9	6.956
18	9 8 35.32	2.3404	17 1 34.2	7.067
19	9 10 55.76	2.3408	16 54 26.9	7.177
20	9 13 16.22	2.3413	16 47 13.0	7.287
21	9 15 36.71	2.3417	16 39 52.5	7.397
22	9 17 57.22	2.3420	16 32 25.4	7.507
23	9 20 17.75	2.3423	N.16 24 51.7	7.616
	SATURDAY 24.			
0	9 22 38.30	2.3426	N.16 17 11.5	7.724
1	9 24 58.86	2.3428	16 9 24.8	7.831
2	9 27 19.44	2.3431	16 1 31.7	7.938
3	9 29 40.03	2.3433	15 53 32.2	8.045
4	9 32 0.63	2.3434	15 45 26.3	8.151
5	9 34 21.24	2.3436	15 37 14.1	8.257
6	9 36 41.87	2.3438	15 28 55.5	8.362
7	9 39 2.50	2.3439	15 20 30.7	8.465
8	9 41 23.14	2.3441	15 11 59.7	8.568
9	9 43 43.79	2.3442	15 3 22.5	8.672
10	9 46 4.44	2.3443	14 54 39.1	8.775
11	9 48 25.10	2.3443	14 45 49.5	8.877
12	9 50 45.76	2.3443	14 36 53.8	8.978
13	9 53 6.42	2.3443	14 27 52.1	9.078
14	9 55 27.08	2.3443	14 18 44.5	9.177
15	9 57 47.74	2.3443	14 9 30.9	9.275
16	10 0 8.40	2.3443	14 0 11.5	9.373
17	10 2 29.06	2.3443	13 50 46.2	9.470
18	10 4 49.72	2.3442	13 41 15.1	9.566
19	10 7 10.37	2.3442	13 31 38.3	9.661
20	10 9 31.02	2.3442	13 21 55.8	9.756
21	10 11 51.67	2.3441	13 12 7.6	9.850
22	10 14 12.31	2.3440	13 2 13.8	9.942
23	10 16 32.95	2.3439	12 52 14.5	10.034
24	10 18 53.58	2.3438	N.12 42 9.7	10.125

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SUNDAY 25.			
	h m s	s	° ′ ″	″
0	10 18 53.58	2.3438	N. 12 42 9.7	10.125
1	10 21 14.21	2.3437	12 31 59.5	10 215
2	10 23 34.83	2.3436	12 21 43.9	10.304
3	10 25 55.44	2.3435	12 11 23.0	10.392
4	10 28 16.05	2.3434	12 0 56.9	10.479
5	10 30 36.65	2.3433	11 50 25.5	10.566
6	10 32 57.24	2.3431	11 39 49.0	10.651
7	10 35 17.82	2.3430	11 29 7.4	10.735
8	10 37 38.40	2.3429	11 18 20.8	10.817
9	10 39 58.97	2.3428	11 7 29.3	10.899
10	10 42 19.53	2.3427	10 56 32.9	10.981
11	10 44 40.09	2.3426	10 45 31.6	11.061
12	10 47 0.64	2.3424	10 34 25.6	11.139
13	10 49 21.18	2.3423	10 23 14.9	11.217
14	10 51 41.72	2.3422	10 11 59.6	11.293
15	10 54 2.25	2.3422	10 0 39.7	11.368
16	10 56 22.78	2.3421	9 49 15.4	11.442
17	10 58 43.30	2.3419	9 37 46.7	11.515
18	11 1 3.81	2.3418	9 26 13.6	11.587
19	11 3 24.32	2.3418	9 14 36.3	11.657
20	11 5 44.83	2.3417	9 2 54.8	11.727
21	11 8 5.33	2.3417	8 51 9.1	11.795
22	11 10 25.83	2.3417	8 39 19.4	11.862
23	11 12 46.33	2.3417	N. 8 27 25.7	11.927
	MONDAY 26.			
0	11 15 6.83	2.3417	N. 8 15 28.2	11.990
1	11 17 27.33	2.3417	8 3 26.9	12.053
2	11 19 47.83	2.3416	7 51 21.8	12.115
3	11 22 8.32	2.3416	7 39 13.1	12.175
4	11 24 28.82	2.3417	7 27 0.8	12.234
5	11 26 49.32	2.3417	7 14 45.0	12.292
6	11 29 9.82	2.3418	7 2 25.8	12.348
7	11 31 30.33	2.3418	6 50 3.3	12.403
8	11 33 50.84	2.3419	6 37 37.5	12.456
9	11 36 11.36	2.3421	6 25 8.6	12.507
10	11 38 31.89	2.3422	6 12 36.6	12.558
11	11 40 52.43	2.3423	6 0 1.6	12.607
12	11 43 12.97	2.3424	5 47 23.8	12.654
13	11 45 33.52	2.3426	5 34 43.2	12.700
14	11 47 54.09	2.3429	5 21 59.8	12.746
15	11 50 14.67	2.3431	5 9 13.7	12.789
16	11 52 35.26	2.3434	4 56 25.1	12.831
17	11 54 55.87	2.3437	4 43 34.0	12.871
18	11 57 16.50	2.3440	4 30 40.6	12.909
19	11 59 37.15	2.3443	4 17 44.9	12.947
20	12 1 57.82	2.3446	4 4 47.0	12.982
21	12 4 18.50	2.3449	3 51 47.1	13.015
22	12 6 39.21	2.3453	3 38 45.2	13.048
23	12 8 59.94	2.3457	3 25 41.3	13.080
24	12 11 20.70	2.3462	N. 3 12 35.6	13.109

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	TUESDAY 27.			
	h m s	s	° ′ ″	″
0	12 11 20.70	2.3462	N. 3 12 35.6	13.109
1	12 13 41.49	2.3467	2 59 28.2	13.137
2	12 16 2.30	2.3471	2 46 19.2	13.163
3	12 18 23.14	2.3476	2 33 8.6	13.188
4	12 20 44.01	2.3482	2 19 56.6	13.211
5	12 23 4.92	2.3487	2 6 43.3	13.232
6	12 25 25.86	2.3493	1 53 28.7	13.252
7	12 27 46.84	2.3499	1 40 13.0	13.271
8	12 30 7.85	2.3505	1 26 56.2	13.287
9	12 32 28.90	2.3512	1 13 38.5	13.302
10	12 34 49.99	2.3519	1 0 19.9	13.316
11	12 37 11.13	2.3526	0 47 0.6	13.327
12	12 39 32.31	2.3533	0 33 40.7	13.337
13	12 41 53.53	2.3541	0 20 20.2	13.346
14	12 44 14.80	2.3549	N. 0 6 59.2	13.353
15	12 46 36.12	2.3557	S. 0 6 22.1	13.358
16	12 48 57.49	2.3566	0 19 43.7	13.361
17	12 51 18.91	2.3574	0 33 5.4	13.362
18	12 53 40.38	2.3583	0 46 27.2	13.363
19	12 56 1.90	2.3592	0 59 49.0	13.362
20	12 58 23.48	2.3602	1 13 10.6	13.358
21	13 0 45.12	2.3612	1 26 32.0	13.353
22	13 3 6.82	2.3622	1 39 53.0	13.347
23	13 5 28.58	2.3632	S. 1 53 13.6	13.338
	WEDNESDAY 28.			
0	13 7 50.40	2.3642	S. 2 6 33.6	13.328
1	13 10 12.28	2.3653	2 19 53.0	13.317
2	13 12 34.23	2.3664	2 33 11.6	13.303
3	13 14 56.25	2.3676	2 46 29.4	13.288
4	13 17 18.34	2.3687	2 59 46.2	13.272
5	13 19 40.50	2.3698	3 13 2.0	13.253
6	13 22 2.72	2.3710	3 26 16.6	13.233
7	13 24 25 02	2.3722	3 39 30.0	13.212
8	13 26 47.39	2.3735	3 52 42.0	13.188
9	13 29 9.84	2.3748	4 5 52.5	13.163
10	13 31 32.37	2.3761	4 19 1.5	13.136
11	13 33 54.98	2.3774	4 32 8.8	13.107
12	13 36 17.66	2.3787	4 45 14.3	13.077
13	13 38 40.42	2.3801	4 58 18.0	13.045
14	13 41 3.27	2.3815	5 11 19.7	13.012
15	13 43 26.20	2.3828	5 24 19.4	12.977
16	13 45 49.21	2.3842	5 37 16.9	12.939
17	13 48 12.31	2.3857	5 50 12.1	12.901
18	13 50 35.50	2.3872	6 3 5.0	12.861
19	13 52 58.78	2.3887	6 15 55.4	12.818
20	13 55 22.14	2.3901	6 28 43.2	12.775
21	13 57 45.59	2.3916	6 41 28.4	12.730
22	14 0 9.13	2.3932	6 54 10.8	12.683
23	14 2 32.77	2.3947	7 6 50.4	12.636
24	14 4 56.50	2.3962	S. 7 19 27.1	12.586

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	THURSDAY 29.			
	h m s	s	° ′ ″	″
0	14 4 56.50	2.3962	S. 7 19 27.1	12.586
1	14 7 20.32	2.3978	7 32 0.7	12.533
2	14 9 44.24	2.3994	7 44 31.1	12.480
3	14 12 8.25	2.4010	7 56 58.3	12.426
4	14 14 32.36	2.4026	8 9 22.2	12.370
5	14 16 56.56	2.4042	8 21 42.7	12.312
6	14 19 20.86	2.4058	8 33 59.6	12.252
7	14 21 45.26	2.4074	8 46 12.9	12.191
8	14 24 9.75	2.4090	8 58 22.5	12.128
9	14 26 34.34	2.4107	9 10 28.3	12.064
10	14 28 59.03	2.4124	9 22 30.2	11.998
11	14 31 23.82	2.4141	9 34 28.1	11.932
12	14 33 48.72	2.4158	9 46 22.0	11.863
13	14 36 13.72	2.4174	9 58 11.7	11.792
14	14 38 38.81	2.4190	10 9 57.1	11.721
15	14 41 4.00	2.4207	10 21 38.2	11.647
16	14 43 29.30	2.4224	10 33 14.8	11.572
17	14 45 54.69	2.4240	10 44 46.9	11.497
18	14 48 20.18	2.4257	10 56 14.4	11.419
19	14 50 45.78	2.4274	11 7 37.2	11.341
20	14 53 11.47	2.4290	11 18 55.3	11.261
21	14 55 37.26	2.4307	11 30 8.5	11.179
22	14 58 3.16	2.4324	11 41 16.8	11.096
23	15 0 29.15	2.4340	S. 11 52 20.0	11.011
	FRIDAY 30.			
0	15 2 55.24	2.4357	S. 12 3 18.1	10.925
1	15 5 21.43	2.4373	12 14 11.0	10.838
2	15 7 47.72	2.4389	12 24 58.7	10.750
3	15 10 14.10	2.4405	12 35 41.0	10.660
4	15 12 40.58	2.4422	12 46 17.9	10.569
5	15 15 7.16	2.4438	12 56 49.3	10.477
6	15 17 33.83	2.4453	13 7 15.2	10.384
7	15 20 0.59	2.4468	13 17 35.4	10.288
8	15 22 27.45	2.4484	13 27 49.8	10.192
9	15 24 54.40	2.4499	13 37 58.5	10.096
10	15 27 21.44	2.4514	13 48 1.3	9.997
11	15 29 48.57	2.4528	13 57 58.1	9.897
12	15 32 15.78	2.4542	14 7 48.9	9.796
13	15 34 43.08	2.4557	14 17 33.6	9.694
14	15 37 10.47	2.4571	14 27 12.2	9.592
15	15 39 37.94	2.4585	14 36 44.6	9.488
16	15 42 5.49	2.4598	14 46 10.7	9.383
17	15 44 33.12	2.4612	14 55 30.5	9.276
18	15 47 0.83	2.4625	15 4 43.8	9.169
19	15 49 28.62	2.4637	15 13 50.7	9.061
20	15 51 56.48	2.4650	15 22 51.1	8.952
21	15 54 24.42	2.4662	15 31 44.9	8.842
22	15 56 52.43	2.4673	15 40 32.1	8.730
23	15 59 20.50	2.4684	15 49 12.5	8.617
24	16 1 48.64	2.4695	S. 15 57 46.1	8.503
	SATURDAY 31.			
0	16 1 48.64	2.4695	S. 15 57 46.1	8.503
1	16 4 16.84	2.4706	16 6 12.9	8.390
2	16 6 45.11	2.4717	16 14 32.9	8.276
3	16 9 13.44	2.4727	16 22 46.0	8.160
4	16 11 41.83	2.4736	16 30 52.1	8.043
5	16 14 10.27	2.4744	16 38 51.1	7.925
6	16 16 38.76	2.4753	16 46 43.1	7.807
7	16 19 7.30	2.4761	16 54 28.0	7.688
8	16 21 35.89	2.4769	17 2 5.7	7.568
9	16 24 4.52	2.4776	17 9 36.2	7.447
10	16 26 33.20	2.4782	17 16 59.4	7.326
11	16 29 1.91	2.4788	17 24 15.3	7.204
12	16 31 30.66	2.4795	17 31 23.9	7.082
13	16 33 59.45	2.4800	17 38 25.1	6.958
14	16 36 28.26	2.4804	17 45 18.9	6.834
15	16 38 57.10	2.4808	17 52 5.2	6.710
16	16 41 25.96	2.4812	17 58 44.1	6.585
17	16 43 54.84	2.4815	18 5 15.4	6.459
18	16 46 23.74	2.4818	18 11 39.2	6.333
19	16 48 52.66	2.4820	18 17 55.4	6.206
20	16 51 21.58	2.4821	18 24 4.0	6.079
21	16 53 50.51	2.4822	18 30 4.9	5.952
22	16 56 19.44	2.4822	18 35 58.2	5.824
23	16 58 48.37	2.4822	S. 18 41 43.8	5.695
	SUNDAY, APRIL 1.			
0	17 1 17.30	2.4821	S. 18 47 21.6	5.566

PHASES OF THE MOON.

		d	h	m
☾ Last Quarter .	March	4	15	25.9
● New Moon.		12	4	21.0
☽ First Quarter		20	8	43.4
○ Full Moon		27	10	7.5

		d	h
☾ Apogee . . .	March	16	2.4
☾ Perigee		28	10.5

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	III^h.	P. L. of Diff.	VI^h.	P. L. of Diff.	IX^h.	P. L. of Diff.
1	Saturn	W.	82° 11′ 21″	2111	84° 2′ 4″	2115	85° 52′ 40″	2120	87° 43′ 8″	2126
	Regulus	W.	54 24 52	2126	56 15 12	2130	58 5 25	2135	59 55 30	2141
	Jupiter	E.	43 13 39	2163	41 24 16	2169	39 35 2	2176	37 45 58	2184
	Antares	E.	46 32 50	2233	44 45 12	2245	42 57 52	2259	41 10 52	2274
	Venus	E.	105 10 1	2499	103 28 16	2504	101 47 39	2511	100 6 41	2517
2	Regulus	W.	69 3 33	2175	70 52 38	2183	72 41 31	2192	74 30 11	2200
	α Aquilæ	E.	81 16 38	2748	79 41 2	2763	78 5 45	2778	76 30 48	2795
	Venus	E.	91 44 11	2554	90 4 13	2563	88 24 27	2572	86 44 53	2581
	Sun	E.	124 55 39	2491	123 14 13	2499	121 32 58	2507	119 51 55	2517
3	Regulus	W.	83 30 13	2247	85 17 31	2257	87 4 34	2266	88 51 23	2277
	Spica	W.	30 19 53	2370	32 4 11	2368	33 48 31	2368	35 32 51	2370
	Mars	W.	21 40 0	2277	23 26 31	2282	25 13 0	2289	26 59 16	2296
	α Aquilæ	E.	68 42 29	2908	67 10 20	2935	65 38 46	2965	64 7 50	2997
	Venus	E.	78 30 25	2632	76 52 14	2643	75 14 18	2654	73 36 36	2666
	Sun	E.	111 29 58	2566	109 50 16	2577	108 10 49	2588	106 31 37	2599
4	Spica	W.	44 13 21	2395	45 57 3	2403	47 40 34	2410	49 23 55	2418
	Mars	W.	35 47 37	2340	37 32 38	2350	39 17 25	2359	41 1 58	2369
	α Aquilæ	E.	56 43 57	3194	55 17 41	3242	53 52 22	3294	52 28 4	3351
	Venus	E.	65 32 0	2724	63 55 52	2736	62 20 0	2748	60 44 24	2760
	Sun	E.	98 19 27	2656	96 41 48	2668	95 4 25	2680	93 27 18	2692
5	Spica	W.	57 57 39	2462	59 39 45	2472	61 21 38	2481	63 3 18	2491
	Mars	W.	49 41 8	2420	51 24 14	2430	53 7 6	2440	54 49 44	2450
	α Aquilæ	E.	45 44 31	3715	44 28 0	3810	43 13 8	3914	42 0 2	4027
	Venus	E.	52 50 20	2821	51 16 19	2832	49 42 33	2845	48 9 3	2856
	Sun	E.	85 25 40	2751	83 50 8	2763	82 14 52	2775	80 39 52	2787
6	Spica	W.	71 28 12	2540	73 8 30	2550	74 48 34	2560	76 28 24	2569
	Mars	W.	63 19 18	2501	65 0 30	2510	66 41 29	2520	68 22 14	2530
	Jupiter	W.	27 41 8	2559	29 20 59	2566	31 0 41	2573	32 40 13	2581
	Antares	W.	26 29 17	2779	28 4 13	2761	29 39 32	2747	31 15 9	2737
	Venus	E.	40 25 22	2916	38 53 23	2927	37 21 39	2939	35 50 9	2950
	Sun	E.	72 48 42	2846	71 15 14	2857	69 42 0	2869	68 9 1	2880
7	Spica	W.	84 44 13	2618	86 22 43	2629	88 0 59	2638	89 39 2	2648
	Mars	W.	76 42 40	2577	78 22 6	2587	80 1 19	2596	81 40 20	2604
	Jupiter	W.	40 55 12	2621	42 33 38	2629	44 11 53	2638	45 49 56	2647
	Antares	W.	39 15 29	2721	40 51 41	2722	42 27 52	2724	44 4 0	2727
	Sun	E.	60 27 46	2937	58 56 14	2947	57 24 55	2958	55 53 50	2969
8	Jupiter	W.	53 57 16	2689	55 34 10	2698	57 10 52	2707	58 47 23	2715
	Antares	W.	52 3 27	2749	53 39 2	2755	55 14 29	2760	56 49 49	2766
	Sun	E.	48 21 51	3023	46 52 7	3034	45 22 36	3045	43 53 19	3056
9	Jupiter	W.	66 47 10	2757	68 22 34	2765	69 57 48	2773	71 32 51	2782
	Antares	W.	64 44 23	2799	66 18 52	2806	67 53 12	2813	69 27 23	2821
	Sun	E.	36 30 11	3110	35 2 13	3121	33 34 29	3132	32 6 58	3143
10	Jupiter	W.	79 25 27	2821	80 59 27	2829	82 33 17	2837	84 6 57	2845
	Antares	W.	77 15 55	2857	78 49 9	2864	80 22 14	2872	81 55 9	2880

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XV^h.	P. L. of Diff.	XVIII^h.	P. L. of Diff.	XXI^h.	P. L. of Diff.
1	Saturn W.	89° 33′ 27″	2132	91° 23′ 37″	2139	93° 13′ 37″	2146	95° 3′ 26″	2153
	Regulus W.	61 45 26	2147	63 35 13	2154	65 24 50	2161	67 14 17	2168
	Jupiter E.	35 57 6	2192	34 8 26	2201	32 20 0	2211	30 31 49	2223
	Antares E.	39 24 14	2291	37 38 1	2310	35 52 16	2331	34 7 2	2355
	Venus E.	98 25 52	2524	96 45 12	2530	95 4 41	2538	93 24 20	2546
2	Regulus W.	76 18 38	2209	78 6 52	2218	79 54 53	2227	81 42 40	2237
	α Aquilæ E.	74 56 14	2815	73 22 6	2835	71 48 24	2858	70 15 11	2882
	Venus E.	85 5 32	2591	83 26 25	2601	81 47 31	2611	80 8 51	2621
	Sun E.	118 11 5	2526	116 30 28	2535	114 50 4	2545	113 9 54	2556
3	Regulus W.	90 37 56	2287	92 24 14	2298	94 10 16	2309	95 56 3	2319
	Spica W.	37 17 9	2373	39 1 22	2378	40 45 29	2382	42 29 29	2388
	Mars W.	28 45 21	2304	30 31 14	2313	32 16 55	2322	34 2 23	2331
	α Aquilæ E.	62 37 33	3032	61 7 59	3068	59 39 10	3106	58 11 8	3148
	Venus E.	71 59 10	2677	70 21 59	2689	68 45 4	2700	67 8 24	2712
	Sun E.	104 52 40	2610	103 13 58	2621	101 35 32	2633	99 57 22	2644
4	Spica W.	51 7 4	2426	52 50 1	2435	54 32 46	2443	56 15 19	2453
	Mars W.	42 46 17	2379	44 30 22	2389	46 14 12	2400	47 57 47	2410
	α Aquilæ E.	51 4 52	3414	49 42 50	3479	48 22 2	3551	47 2 34	3629
	Venus E.	59 9 3	2772	57 33 59	2784	55 59 10	2796	54 24 37	2808
	Sun E.	91 50 27	2704	90 13 52	2715	88 37 32	2727	87 1 28	2739
5	Spica W.	64 44 44	2501	66 25 56	2510	68 6 55	2520	69 47 40	2530
	Mars W.	56 32 7	2460	58 14 16	2470	59 56 11	2480	61 37 52	2491
	α Aquilæ E.	40 48 49	4154	39 39 39	4293	38 32 40	4448	37 28 2	4623
	Venus E.	46 35 48	2868	45 2 48	2880	43 30 4	2892	41 57 35	2905
	Sun E.	79 5 7	2799	77 30 38	2811	75 56 24	2822	74 22 25	2835
6	Spica W.	78 8 1	2580	79 47 24	2589	81 26 34	2599	83 5 30	2609
	Mars W.	70 2 46	2540	71 43 4	2549	73 23 9	2559	75 3 1	2568
	Jupiter W.	34 19 34	2588	35 58 45	2596	37 37 45	2604	39 16 34	2612
	Antares W.	32 51 0	2729	34 27 1	2725	36 3 8	2722	37 39 18	2722
	Venus E.	34 18 54	2962	32 47 53	2973	31 17 6	2985	29 46 34	2995
	Sun E.	66 36 17	2892	65 3 48	2903	63 31 33	2914	61 59 32	2926
7	Spica W.	91 16 52	2657	92 54 29	2667	94 31 53	2677	96 9 4	2686
	Mars W.	83 19 9	2613	84 57 46	2623	86 36 10	2632	88 14 22	2640
	Jupiter W.	47 27 47	2655	49 5 27	2664	50 42 55	2673	52 20 11	2681
	Antares W.	45 40 4	2731	47 16 3	2735	48 51 57	2739	50 27 45	2744
	Sun E.	54 22 59	2981	52 52 22	2991	51 21 58	3002	49 51 48	3013
8	Jupiter W.	60 23 43	2723	61 59 52	2732	63 35 49	2741	65 11 35	2749
	Antares W.	58 25 1	2773	60 0 4	2779	61 34 59	2786	63 9 45	2792
	Sun E.	42 24 15	3066	40 55 24	3077	39 26 46	3088	37 58 22	3099
9	Jupiter W.	73 7 43	2789	74 42 25	2798	76 16 56	2805	77 51 17	2814
	Antares W.	71 1 24	2828	72 35 16	2835	74 8 58	2842	75 42 31	2849
	Sun E.	30 39 41	3156	29 12 39	3168	27 45 51	3180	26 19 18	3193
10	Jupiter W.	85 40 26	2853	87 13 45	2861	88 46 54	2868	90 19 54	2875
	Antares W.	83 27 54	2887	85 0 30	2894	86 32 56	2902	88 5 12	2910

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	III^h.	P. L. of Diff.	VI^h.	P. L. of Diff.	IX^h.	P. L. of Diff.
10	Sun E.	24° 53′ 1″	3208	23° 27′ 1″	3223	22° 1′ 19″	3239	20° 35′ 56″	3256
14	Sun W.	20 43 6	3466	22 4 8	3464	23 25 12	3463	24 46 17	3463
	Aldebaran E.	53 25 26	3026	51 55 45	3030	50 26 10	3035	48 56 41	3040
	Saturn E.	105 15 48	3014	103 45 53	3020	102 16 5	3025	100 46 23	3030
15	Sun W.	31 31 28	3471	32 52 25	3472	34 13 20	3474	35 34 13	3475
	Aldebaran E.	41 30 41	3061	40 1 44	3065	38 32 51	3069	37 4 3	3072
	Pollux E.	85 46 34	3104	84 18 29	3108	82 50 29	3111	81 22 33	3114
	Saturn E.	93 19 20	3051	91 50 10	3054	90 21 4	3057	88 52 2	3060
16	Sun W.	42 18 18	3480	43 39 4	3480	44 59 49	3481	46 20 35	3480
	Aldebaran E.	29 40 50	3082	28 12 19	3083	26 43 49	3085	25 15 21	3086
	Pollux E.	74 3 47	3128	72 36 11	3129	71 8 37	3130	69 41 4	3131
	Saturn E.	81 27 42	3071	79 58 57	3072	78 30 13	3073	77 1 30	3073
17	Sun W.	53 4 34	3475	54 25 26	3472	55 46 21	3470	57 7 19	3466
	Pollux E.	62 23 40	3136	60 56 14	3135	59 28 47	3134	58 1 19	3133
	Saturn E.	69 37 58	3070	68 9 12	3069	66 40 25	3068	65 11 36	3065
	Regulus E.	98 1 16	3079	96 32 41	3078	95 4 4	3076	93 35 25	3073
18	Sun W.	63 53 13	3444	65 14 40	3438	66 36 13	3432	67 57 53	3426
	α Arietis W.	29 47 53	3719	31 4 20	3658	32 21 52	3604	33 40 22	3556
	Pollux E.	50 43 44	3129	49 16 9	3126	47 48 31	3124	46 20 51	3123
	Saturn E.	57 46 32	3047	56 17 17	3041	54 47 55	3036	53 18 27	3030
	Regulus E.	86 11 11	3054	84 42 5	3049	83 12 53	3043	81 43 34	3038
19	Sun W.	74 48 16	3386	76 10 49	3376	77 33 33	3365	78 56 29	3356
	α Arietis W.	40 24 39	3371	41 47 29	3340	43 10 54	3312	44 34 51	3285
	Pollux E.	39 2 1	3115	37 34 10	3115	36 6 19	3115	34 38 28	3116
	Saturn E.	45 49 9	2995	44 18 50	2986	42 48 20	2977	41 17 39	2969
	Regulus E.	74 14 59	3001	72 44 48	2993	71 14 26	2983	69 43 52	2974
20	Sun W.	85 54 17	3296	87 18 33	3283	88 43 4	3270	90 7 51	3255
	α Arietis W.	51 42 4	3166	53 8 54	3144	54 36 10	3124	56 3 51	3102
	Aldebaran W.	18 4 13	2925	19 36 0	2912	21 8 4	2899	22 40 24	2886
	Saturn E.	33 41 10	2916	32 9 11	2904	30 36 57	2892	29 4 28	2880
	Regulus E.	62 7 56	2920	60 36 2	2908	59 3 53	2895	57 31 28	2883
21	Sun W.	97 16 6	3179	98 42 40	3163	100 9 34	3145	101 36 49	3129
	α Arietis W.	63 28 41	2999	64 58 55	2979	66 29 34	2959	68 0 38	2939
	Aldebaran W.	30 26 35	2812	32 0 47	2797	33 35 19	2782	35 10 11	2765
	Regulus E.	49 45 5	2812	48 10 53	2797	46 36 21	2781	45 1 28	2766
	Spica E.	103 34 0	2844	102 0 29	2828	100 26 38	2812	98 52 26	2796
22	Sun W.	108 58 21	3038	110 27 47	3019	111 57 36	3001	113 27 48	2981
	Aldebaran W.	43 10 1	2680	44 47 8	2663	46 24 38	2644	48 2 33	2626
	Regulus E.	37 1 44	2681	35 24 39	2664	33 47 11	2647	32 9 20	2629
	Spica E.	90 56 0	2710	89 19 34	2693	87 42 45	2675	86 5 32	2657
	Mars E.	96 54 26	2607	95 15 40	2588	93 36 29	2570	91 56 53	2552
23	Sun W.	121 4 57	2883	122 37 38	2863	124 10 44	2844	125 44 15	2825

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XV^h.	P. L. of Diff.	XVIII^h.	P. L. of Diff.	XXI^h.	P. L. of Diff.
		° ′ ″		° ′ ″		° ′ ″		° ′ ″	
10	SUN E.	19 10 53	3276	17 46 13	3299	16 22 0	3326	14 58 19	3360
14	SUN W.	26 7 22	3464	27 28 26	3466	28 49 28	3467	30 10 29	3469
	Aldebaran E.	47 27 18	3044	45 58 0	3049	44 28 48	3054	42 59 42	3058
	SATURN E.	99 16 48	3034	97 47 18	3039	96 17 54	3043	94 48 35	3047
15	SUN W.	36 55 5	3476	38 15 56	3478	39 36 45	3480	40 57 32	3480
	Aldebaran E.	35 35 19	3074	34 6 38	3076	32 37 59	3078	31 9 23	3081
	Pollux E.	79 54 41	3118	78 26 53	3120	76 59 8	3123	75 31 26	3125
	SATURN E.	87 23 4	3063	85 54 9	3065	84 25 17	3068	82 56 28	3070
16	SUN W.	47 41 21	3479	49 2 8	3479	50 22 55	3478	51 43 44	3477
	Aldebaran E.	23 46 54	3086	22 18 27	3087	20 50 1	3087	19 21 36	3087
	Pollux E.	68 13 32	3133	66 46 2	3133	65 18 33	3135	63 51 6	3136
	SATURN E.	75 32 48	3073	74 4 6	3073	72 35 24	3073	71 6 42	3072
17	SUN W.	58 28 21	3463	59 49 27	3459	61 10 37	3454	62 31 52	3449
	Pollux E.	56 33 50	3133	55 6 20	3132	53 38 49	3131	52 11 17	3130
	SATURN E.	63 42 44	3062	62 13 48	3058	60 44 47	3055	59 15 42	3051
	Regulus E.	92 6 43	3070	90 37 57	3066	89 9 6	3063	87 40 11	3059
18	SUN W.	69 19 40	3419	70 41 35	3411	72 3 39	3402	73 25 53	3394
	α Arietis W.	34 59 44	3513	36 19 54	3472	37 40 49	3436	39 2 25	3402
	Pollux E.	44 53 9	3121	43 25 25	3119	41 57 39	3118	40 29 51	3116
	SATURN E.	51 48 52	3024	50 19 9	3018	48 49 18	3010	47 19 18	3003
	Regulus E.	80 14 8	3031	78 44 34	3025	77 14 52	3017	75 45 0	3009
19	SUN W.	80 19 36	3345	81 42 56	3333	83 6 29	3321	84 30 16	3309
	α Arietis W.	45 59 20	3259	47 24 19	3236	48 49 46	3212	50 15 41	3188
	Pollux E.	33 10 38	3118	31 42 50	3122	30 15 7	3128	28 47 31	3135
	SATURN E.	39 46 47	2959	38 15 43	2949	36 44 26	2938	35 12 55	2927
	Regulus E.	68 13 7	2965	66 42 10	2954	65 10 59	2943	63 39 35	2931
20	SUN W.	91 32 55	3241	92 58 16	3226	94 23 54	3210	95 49 51	3195
	α Arietis W.	57 31 58	3081	59 0 31	3060	60 29 29	3040	61 58 52	3019
	Aldebaran W.	24 13 1	2872	25 45 56	2857	27 19 10	2842	28 52 43	2828
	SATURN E.	27 31 43	2867	25 58 42	2854	24 25 24	2841	22 51 49	2827
	Regulus E.	55 58 47	2869	54 25 49	2855	52 52 33	2841	51 18 58	2827
21	SUN W.	103 4 24	3111	104 32 20	3093	106 0 38	3075	107 29 18	3056
	α Arietis W.	69 32 7	2920	71 4 1	2900	72 36 20	2880	74 9 5	2859
	Aldebaran W.	36 45 25	2749	38 21 0	2732	39 56 57	2715	41 33 17	2697
	Regulus E.	43 26 15	2750	41 50 41	2733	40 14 45	2716	38 38 26	2698
	Spica E.	97 17 53	2779	95 42 58	2763	94 7 41	2746	92 32 2	2729
22	SUN W.	114 58 25	2961	116 29 26	2942	118 0 51	2923	119 32 41	2902
	Aldebaran W.	49 40 52	2608	51 19 36	2589	52 58 46	2571	54 38 21	2552
	Regulus E.	30 31 5	2611	28 52 25	2593	27 13 21	2575	25 33 52	2557
	Spica E.	84 27 55	2639	82 49 53	2621	81 11 27	2603	79 32 36	2585
	MARS E.	90 16 52	2533	88 36 25	2515	86 55 33	2497	85 14 15	2477
23	SUN W.	127 18 11	2805	128 52 33	2785	130 27 21	2766	132 2 34	2747

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	III^h.	P. L. of Diff.	VI^h.	P. L. of Diff.	IX^h.	P. L. of Diff.
23	Aldebaran	W.	56° 18′ 22″	2533	57° 58′ 49″	2514	59° 39′ 43″	2495	61° 21′ 3″	2477
	Spica	E.	77 53 20	2566	76 13 38	2548	74 33 31	2529	72 52 58	2511
	Mars	E.	83 32 30	2458	81 50 18	2440	80 7 40	2421	78 24 35	2401
24	Aldebaran	W.	69 54 23	2382	71 38 24	2364	73 22 51	2345	75 7 45	2327
	Pollux	W.	26 50 11	2591	28 29 18	2551	30 9 21	2514	31 50 15	2480
	Saturn	W.	18 18 28	2389	20 2 19	2368	21 46 40	2348	23 31 29	2330
	Spica	E.	64 23 54	2421	62 40 49	2404	60 57 20	2387	59 13 27	2371
	Mars	E.	69 42 20	2307	67 56 31	2289	66 10 15	2270	64 23 32	2252
	Jupiter	E.	108 23 29	2388	106 39 37	2369	104 55 18	2350	103 10 32	2333
25	Aldebaran	W.	83 58 44	2241	85 46 11	2224	87 34 3	2207	89 22 20	2191
	Pollux	W.	40 25 46	2340	42 10 47	2317	43 56 21	2295	45 42 28	2274
	Saturn	W.	32 22 18	2240	34 9 46	2223	35 57 39	2207	37 45 56	2191
	Spica	E.	50 28 14	2295	48 42 7	2281	46 55 40	2269	45 8 55	2258
	Mars	E.	55 23 21	2166	53 34 2	2150	51 44 19	2134	49 54 11	2118
	Jupiter	E.	94 20 7	2244	92 32 45	2228	90 44 59	2212	88 56 49	2196
	Antares	E.	96 22 20	2293	94 36 10	2277	92 49 36	2260	91 2 38	2244
26	Pollux	W.	54 40 15	2184	56 29 7	2169	58 18 22	2155	60 7 58	2141
	Saturn	W.	46 53 4	2120	48 43 33	2107	50 34 21	2095	52 25 28	2084
	Regulus	W.	18 22 5	2130	20 12 18	2116	22 2 53	2103	23 53 48	2090
	Spica	E.	36 11 23	2217	34 23 21	2214	32 35 14	2213	30 47 6	2216
	Mars	E.	40 37 55	2050	38 45 38	2037	36 53 2	2026	35 0 9	2016
	Jupiter	E.	79 50 16	2124	77 59 54	2112	76 9 13	2100	74 18 14	2089
	Antares	E.	82 2 13	2174	80 13 7	2163	78 23 43	2151	76 34 2	2141
27	Pollux	W.	69 20 42	2086	71 12 3	2077	73 3 37	2070	74 55 23	2062
	Saturn	W.	61 45 6	2037	63 37 43	2029	65 30 32	2023	67 23 31	2016
	Regulus	W.	33 12 44	2041	35 5 15	2033	36 57 58	2026	38 50 52	2019
	Jupiter	E.	64 59 16	2042	63 6 47	2035	61 14 7	2028	59 21 17	2023
	Antares	E.	67 22 0	2100	65 31 1	2094	63 39 53	2090	61 48 39	2086
28	Saturn	W.	76 50 23	1998	78 44 0	1997	80 37 39	1996	82 31 19	1996
	Regulus	W.	48 17 23	2001	50 10 56	1999	52 4 32	1998	53 58 10	1998
	Jupiter	E.	49 55 22	2007	48 1 59	2006	46 8 34	2006	44 15 9	2007
	Antares	E.	52 31 38	2085	50 40 16	2088	48 48 59	2093	46 57 49	2099
29	Regulus	W.	63 25 54	2010	65 19 13	2014	67 12 25	2019	69 5 30	2024
	Jupiter	E.	34 49 0	2026	32 56 7	2033	31 3 25	2042	29 10 57	2052
	Antares	E.	37 45 16	2158	35 55 45	2176	34 6 42	2198	32 18 12	2225
30	Regulus	W.	78 28 21	2063	80 20 17	2072	82 11 59	2082	84 3 26	2093
	Spica	W.	25 25 56	2229	27 13 41	2218	29 1 41	2212	30 49 50	2209
	Mars	W.	20 53 6	1999	22 46 42	2004	24 40 10	2010	26 33 28	2018
	α Aquilæ	E.	73 8 6	2690	71 31 13	2714	69 54 52	2740	68 19 5	2767
31	Regulus	W.	93 16 22	2153	95 6 1	2166	96 55 20	2179	98 44 19	2192
	Spica	W.	39 50 32	2227	41 38 19	2235	43 25 55	2243	45 13 18	2253
	Mars	W.	35 56 36	2067	37 48 26	2079	39 39 58	2090	41 31 12	2103
	α Aquilæ	E.	60 30 17	2945	58 58 55	2989	57 28 29	3037	55 59 2	3089
	Sun	E.	129 27 32	2476	127 45 45	2489	126 4 17	2504	124 23 9	2518

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^h.	P. L. of Diff.	XVIII^h.	P. L. of Diff.	XXI^h.	P. L. of Diff.
23	Aldebaran	W.	63° 2′ 49″	2458	64° 45′ 2″	2438	66° 27′ 42″	2419	68° 10′ 49″	2401
	Spica	E.	71 12 0	2493	69 30 37	2475	67 48 48	2457	66 6 34	2438
	Mars	E.	76 41 2	2382	74 57 2	2364	73 12 35	2345	71 27 41	2326
24	Aldebaran	W.	76 53 5	2309	78 38 51	2291	80 25 3	2274	82 11 41	2257
	Pollux	W.	33 31 57	2448	35 14 24	2418	36 57 33	2391	38 41 21	2365
	Saturn	W.	25 16 45	2311	27 2 28	2293	28 48 38	2274	30 35 15	2257
	Spica	E.	57 29 10	2354	55 44 29	2339	53 59 26	2324	52 14 1	2309
	Mars	E.	62 36 22	2235	60 48 46	2216	59 0 43	2200	57 12 15	2184
	Jupiter	E.	101 25 20	2314	99 39 41	2296	97 53 35	2279	96 7 4	2261
25	Aldebaran	W.	91 11 1	2176	93 0 4	2162	94 49 29	2147	96 39 16	2134
	Pollux	W.	47 29 5	2255	49 16 11	2235	51 3 46	2217	52 51 48	2200
	Saturn	W.	39 34 37	2176	41 23 41	2161	43 13 7	2147	45 2 55	2133
	Spica	E.	43 21 53	2247	41 34 35	2237	39 47 3	2229	37 59 18	2222
	Mars	E.	48 3 40	2103	46 12 46	2089	44 21 30	2075	42 29 53	2062
	Jupiter	E.	87 8 15	2180	85 19 18	2166	83 29 59	2151	81 40 18	2137
	Antares	E.	89 15 16	2229	87 27 31	2214	85 39 25	2201	83 50 59	2188
26	Pollux	W.	61 57 54	2128	63 48 10	2116	65 38 44	2105	67 29 35	2095
	Saturn	W.	54 16 52	2073	56 8 33	2062	58 0 30	2053	59 52 41	2044
	Regulus	W.	25 45 2	2079	27 36 34	2068	29 28 22	2058	31 20 26	2049
	Spica	E.	28 59 2	2221	27 11 6	2231	25 23 24	2246	23 36 5	2269
	Mars	E.	33 6 59	2006	31 13 34	1998	29 19 56	1990	27 26 6	1983
	Jupiter	E.	72 26 58	2078	70 35 25	2068	68 43 36	2059	66 51 33	2050
	Antares	E.	74 44 5	2131	72 53 53	2122	71 3 27	2114	69 12 49	2107
27	Pollux	W.	76 47 20	2057	78 39 26	2052	80 31 39	2048	82 23 59	2044
	Saturn	W.	69 16 40	2011	71 9 57	2007	73 3 20	2003	74 56 49	2000
	Regulus	W.	40 43 56	2014	42 37 9	2010	44 30 28	2006	46 23 53	2003
	Jupiter	E.	57 28 19	2018	55 35 13	2014	53 42 1	2010	51 48 43	2009
	Antares	E.	59 57 19	2084	58 5 55	2083	56 14 29	2083	54 23 3	2083
28	Saturn	W.	84 24 59	1997	86 18 38	1999	88 12 14	2001	90 5 46	2004
	Regulus	W.	55 51 48	1998	57 45 25	2000	59 38 59	2003	61 32 29	2006
	Jupiter	E.	42 21 46	2009	40 28 26	2012	38 35 11	2016	36 42 2	2021
	Antares	E.	45 6 49	2107	43 16 1	2116	41 25 27	2128	39 35 11	2142
29	Regulus	W.	70 58 27	2031	72 51 13	2038	74 43 48	2046	76 36 11	2054
	Jupiter	E.	27 18 41	2063	25 26 48	2075	23 35 11	2090	21 43 57	2109
	Antares	E.	30 30 21	2255	28 43 15	2290	26 57 1	2332	25 11 48	2383
30	Regulus	W.	85 54 36	2104	87 45 29	2115	89 36 5	2127	91 26 23	2139
	Spica	W.	32 38 1	2208	31 26 19	2210	30 14 31	2215	28 2 36	2221
	Mars	W.	28 26 34	2026	30 19 27	2035	32 12 6	2046	34 4 29	2056
	α Aquilæ	E.	66 43 54	2798	65 9 23	2830	63 35 34	2866	62 2 31	2904
31	Regulus	W.	100 32 58	2206	102 21 16	2221	104 9 12	2236	105 56 46	2251
	Spica	W.	47 0 26	2264	48 47 18	2275	50 33 51	2287	52 20 13	2299
	Mars	W.	43 22 6	2116	45 12 40	2130	47 2 54	2143	48 52 48	2157
	α Aquilæ	E.	54 30 39	3144	53 3 23	3204	51 37 19	3270	50 12 32	3341
	Sun	E.	122 42 21	2533	121 1 53	2547	119 21 45	2561	117 41 57	2577

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.	Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Added to / Subtracted from Apparent Time.	Diff. for 1 Hour.
		h m s	s	° ′ ″	″	′ ″	s	m s	s
SUN.	1	0 44 51.99	9.100	N. 4 49 25.4	+57.67	16 1.94	64.52	3 45.50	0.754
Mon.	2	0 48 30.47	9.106	5 12 27.0	57.45	16 1.65	64.54	3 27.48	0.748
Tues.	3	0 52 9.10	9.113	5 35 23.1	57.22	16 1.36	64.56	3 9.61	0.741
Wed.	4	0 55 47.92	9.121	5 58 13.4	+56.97	16 1.08	64.59	2 51.91	0.733
Thur.	5	0 59 26.93	9.130	6 20 57.6	56.71	16 0.80	64.61	2 34.41	0.724
Frid.	6	1 3 6.15	9.139	6 43 35.5	56.44	16 0.52	64.64	2 17.13	0.715
Sat.	7	1 6 45.59	9.149	7 6 6.7	+56.15	16 0.24	64.67	2 0.08	0.705
SUN.	8	1 10 25.28	9.159	7 28 30.6	55.84	15 59.96	64.71	1 43.26	0.695
Mon.	9	1 14 5.24	9.170	7 50 47.0	55.52	15 59.68	64.75	1 26.71	0.684
Tues.	10	1 17 45.48	9.182	8 12 55.6	+55.19	15 59.41	64.79	1 10.44	0.672
Wed.	11	1 21 26.00	9.194	8 34 56.1	54.84	15 59.14	64.83	0 54.46	0.660
Thur.	12	1 25 6.82	9.207	8 56 48.1	54.47	15 58.87	64.88	0 38.77	0.647
Frid.	13	1 28 47.95	9.220	9 18 31.0	+54.09	15 58.60	64.92	0 23.38	0.634
Sat.	14	1 32 29.40	9.234	9 40 4.7	53.70	15 58.34	64.97	0 8.32	0.620
SUN.	15	1 36 11.19	9.248	10 1 28.8	53.29	15 58.08	65.02	0 6.40	0.606
Mon.	16	1 39 53.32	9.263	10 22 43.0	+52.87	15 57.82	65.08	0 20.78	0.591
Tues.	17	1 43 35.82	9.278	10 43 46.8	52.43	15 57.56	65.14	0 34.79	0.576
Wed.	18	1 47 18.70	9.295	11 4 39.9	51.98	15 57.30	65.20	0 48.42	0.560
Thur.	19	1 51 1.97	9.312	11 25 22.0	+51.51	15 57.05	65.26	1 1.67	0.543
Frid.	20	1 54 45.65	9.329	11 45 52.7	51.03	15 56.80	65.33	1 14.52	0.526
Sat.	21	1 58 29.74	9.347	12 6 11.8	50.54	15 56.55	65.39	1 26.95	0.508
SUN.	22	2 2 14.26	9.365	12 26 19.0	+50.03	15 56.30	65.46	1 38 95	0.490
Mon.	23	2 5 59.23	9.384	12 46 13.8	49.51	15 56.05	65.53	1 50.50	0.471
Tues.	24	2 9 44.66	9.403	13 5 56.0	48.98	15 55.80	65.60	2 1.60	0.452
Wed.	25	2 13 30.57	9.423	13 25 25.3	+48.44	15 55.55	65.67	2 12.22	0.432
Thur.	26	2 17 16.97	9.444	13 44 41.3	47.88	15 55.30	65.74	2 22.34	0 411
Frid.	27	2 21 3.87	9.465	14 3 43.8	47.32	15 55.05	65.81	2 31.96	0.390
Sat.	28	2 24 51.29	9.487	14 22 32.4	+46.74	15 54.80	65.89	2 41.08	0.368
SUN.	29	2 28 39.23	9.509	14 41 6.9	46.14	15 54.55	65.96	2 49.66	0.346
Mon.	30	2 32 27.72	9.532	14 59 27.0	45.53	15 54.30	66.04	2 57.70	0.323
Tues.	31	2 36 16.77	9.555	N.15 17 32.4	+44.91	15 54.06	66.11	3 5.19	0.300

NOTE.—The mean time of semidiameter passing may be found by subtracting 0s.18 from the sidereal time.
The sign + prefixed to the hourly change of declination indicates that north declinations are increasing.

AT GREENWICH MEAN NOON.

Day of the Week	Day of the Month	THE SUN'S Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Equation of Time, to be Subtracted from / Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	s	m s	s	h m s
SUN.	1	0 44 51.42	9.102	N. 4 49 21.8	+57.68	3 45.55	0.754	0 41 5.87
Mon.	2	0 48 29.94	9.108	5 12 23.7	57.46	3 27.52	0.748	0 45 2.42
Tues.	3	0 52 8.63	9.115	5 35 20.1	57.23	3 9.66	0.741	0 48 58.97
Wed.	4	0 55 47.48	9.123	5 58 10.7	+56.98	2 51.95	0.733	0 52 55.53
Thur.	5	0 59 26.53	9.132	6 20 55.2	56.72	2 34.45	0.724	0 56 52.08
Frid.	6	1 3 5.80	9.141	6 43 33.4	56.45	2 17.17	0.715	1 0 48.63
Sat.	7	1 6 45.29	9.151	7 6 4.8	+56.16	2 0.11	0.705	1 4 45.18
SUN.	8	1 10 25.02	9.161	7 28 29.0	55.85	1 43.28	0.695	1 8 41.74
Mon.	9	1 14 5.02	9.172	7 50 45.7	55.53	1 26.73	0.684	1 12 38.29
Tues.	10	1 17 45.30	9.184	8 12 54.6	+55.20	1 10.46	0.672	1 16 34.84
Wed.	11	1 21 25.86	9.196	8 34 55.3	54.85	0 54.47	0.670	1 20 31.39
Thur.	12	1 25 6.72	9.209	8 56 47.5	54.48	0 38.77	0.647	1 24 27.95
Frid.	13	1 28 47.89	9.222	9 18 30.7	+54.10	0 23.38	0.634	1 28 24.50
Sat.	14	1 32 29.38	9.236	9 40 4.6	53.71	0 8.32	0.620	1 32 21.06
SUN.	15	1 36 11.21	9.250	10 1 28.9	53.30	0 6.40	0.606	1 36 17.61
Mon.	16	1 39 53.38	9.265	10 22 43.3	+52.88	0 20.78	0.591	1 40 14.16
Tues.	17	1 43 35.92	9.280	10 43 47.3	52.44	0 34.79	0.576	1 44 10.71
Wed.	18	1 47 18.84	9.296	11 4 40.6	51.99	0 48.43	0.560	1 48 7.27
Thur.	19	1 51 2.14	9.313	11 25 22.9	+51.52	1 1.68	0.543	1 52 3.82
Frid.	20	1 54 45.85	9.330	11 45 53.8	51.04	1 14.53	0.526	1 56 0.38
Sat.	21	1 58 29.97	9.348	12 6 13.1	50.55	1 26.96	0.508	1 59 56.93
SUN.	22	2 2 14.52	9.366	12 26 20.4	+50.04	1 38.96	0.490	2 3 53.48
Mon.	23	2 5 59.52	9.385	12 46 15.4	49.52	1 50.51	0.471	2 7 50.03
Tues.	24	2 9 44.98	9.404	13 5 57.7	48.99	2 1.61	0.452	2 11 46.59
Wed.	25	2 13 30.91	9.424	13 25 27.1	+48.45	2 12.23	0.432	2 15 43.14
Thur.	26	2 17 17.34	9.445	13 44 43.2	47.89	2 22.36	0.411	2 19 39.70
Frid.	27	2 21 4.27	9.466	14 3 45.8	47.32	2 31.98	0.390	2 23 36.25
Sat.	28	2 24 51.71	9.488	14 22 34.5	+46.74	2 41.10	0.368	2 27 32.81
SUN.	29	2 28 39.68	9.510	14 41 9.1	46.14	2 49.68	0.346	2 31 29.36
Mon.	30	2 32 28.19	9.533	14 59 29.2	45.53	2 57.72	0.323	2 35 25.91
Tues.	31	2 36 17.26	9.556	N. 15 17 34.6	+44.91	3 5.20	0.300	2 39 22.46

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign + prefixed to the hourly change of declination indicates that north declinations are increasing.

Diff. for 1 Hour, + 9s.8565. (Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S TRUE LONGITUDE. λ	THE SUN'S TRUE LONGITUDE. λ'	Diff. for 1 Hour.	THE SUN'S LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		° ′ ″	′ ″	″	″			h m s
1	92	12 12 2.8	12 4.9	147.77	+ 0.34	0.0000307	+53.2	23 15 4.96
2	93	13 11 8.4	11 10.4	147.70	0.26	0.0001586	53.3	23 11 9.05
3	94	14 10 12.2	10 14.1	147.63	0.14	0.0002865	53.3	23 7 13.14
4	95	15 9 14.3	9 16.2	147.55	+ 0.01	0.0004143	+53.2	23 3 17.23
5	96	16 8 14.7	8 16.5	147.48	− 0.12	0.0005418	53.0	22 59 21.33
6	97	17 7 13.3	7 15.0	147.40	0.25	0.0006688	52.8	22 55 25.42
7	98	18 6 10.1	6 11.7	147.33	− 0.38	0.0007953	+52.6	22 51 29.51
8	99	19 5 5.1	5 6.6	147.25	0.50	0.0009211	52.3	22 47 33.60
9	100	20 3 58.2	3 59.6	147.17	0.61	0.0010461	51.9	22 43 37.70
10	101	21 2 49.4	2 50.7	147.09	− 0.69	0.0011702	+51.5	22 39 41.79
11	102	22 1 38.8	1 40.0	147.01	0.73	0.0012932	51.1	22 35 45.88
12	103	23 0 26.2	0 27.3	146.93	0.75	0.0014152	50.6	22 31 49.97
13	104	23 59 11.5	59 12.5	146.84	− 0.74	0.0015361	+50.2	22 27 54.07
14	105	24 57 54.6	57 55.5	146.75	0.70	0.0016560	49.8	22 23 58.16
15	106	25 56 35.6	56 36.4	146.66	0.63	0.0017749	49.4	22 20 2.25
16	107	26 55 14 4	55 15.1	146.57	− 0.53	0.0018927	+48.9	22 16 6.31
17	108	27 53 50.9	53 51.5	146.48	0.42	0.0020096	48.5	22 12 10.44
18	109	28 52 25.3	52 25.8	146.39	0.30	0.0021257	48.2	22 8 14.53
19	110	29 50 57.5	50 57.9	146.30	− 0.17	0.0022412	+47.9	22 4 18.62
20	111	30 49 27.6	49. 27.9	146.21	− 0.04	0.0023560	47.7	22 0 22.72
21	112	31 47 55.5	47 55.7	146.12	+ 0.08	0.0024702	47.5	21 56 26.82
22	113	32 46 21.2	46 21.3	146.03	+ 0.19	0.0025839	+47.3	21 52 30.91
23	114	33 44 44.9	44 44.8	145.94	0.27	0.0026973	47.2	21 48 35.00
24	115	34 43 6.6	43 6.4	145.86	0.33	0.0028104	47.1	21 44 39.09
25	116	35 41 26.4	41 26.1	145.78	+ 0.37	0.0029232	+47.0	21 40 43.19
26	117	36 39 44.3	39 43.9	145.71	0.38	0.0030357	46.8	21 36 47.28
27	118	37 38 0.4	37 59.9	145.64	0.35	0.0031479	46.7	21 32 51.37
28	119	38 36 14.8	36 14.2	145.57	+ 0.29	0.0032597	+46.5	21 28 55.46
29	120	39 34 27.6	34 26.9	145.50	0.21	0.0033710	46.3	21 24 59.55
30	121	40 32 38 9	32 38.0	145.44	+ 0.10	0.0034816	46.0	21 21 3.64
31	122	41 30 48.7	30 47.7	145.38	− 0.02	0.0035916	+45.7	21 17 7.73

NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ', to the mean equinox of January $0^d.0$.

Diff. for 1 Hour, $-9^s.8296$. (Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	16 14.5	16 8.0	59 29.9	−1.94	59 6.0	−2.02	16 59.5	2.40	19.2
2	16 1.3	15 54.6	58 41.4	2.06	58 16.6	2.06	17 56.5	2.34	20.2
3	15 47.9	15 41.4	57 52.0	2.03	57 28.0	1.96	18 51.7	2.25	21.2
4	15 35.1	15 29.2	57 5.0	−1.87	56 43.2	−1.77	19 44.4	2.13	22.2
5	15 23.5	15 18.3	56 22.5	1.67	56 3.2	1.55	20 34.2	2.02	23.2
6	15 13.4	15 8.9	55 45.3	1.43	55 28.9	1.31	21 21.3	1.91	24.2
7	15 4.8	15 1.1	55 13.9	−1.19	55 0.3	−1.08	22 6.2	1.83	25.2
8	14 57.8	14 54.8	54 48.1	0.96	54 37.2	0.85	22 49.4	1.77	26.2
9	14 52.3	14 50.0	54 27.7	0.74	54 19.4	0.64	23 31.6	1.74	27.2
10	14 48.1	14 46.5	54 12.3	−0.54	54 6.4	−0.44	δ		28.2
11	14 45.2	14 44.3	54 1.8	0.33	53 58.5	−0.22	0 13.4	1.75	0.1
12	14 43.8	14 43.6	53 56.5	−0.11	53 55.9	+0.01	0 55.6	1.77	1.1
13	14 43.8	14 44.5	53 56.8	+0.14	53 59.2	+0.27	1 38.7	1.82	2.1
14	14 45.6	14 47.1	54 3.2	0.40	54 8.9	0.55	2 23.1	1.88	3.1
15	14 49.2	14 51.8	54 16.5	0.71	54 26.0	0.88	3 9.1	1.96	4.1
16	14 55.0	14 58.7	54 37.6	+1.05	54 51.2	+1.22	3 57.0	2.03	5.1
17	15 2.9	15 7.8	55 6.9	1.40	55 24.7	1.58	4 46.6	2.10	6.1
18	15 13.2	15 19.2	55 44.7	1.75	56 6.7	1.91	5 37.6	2.15	7.1
19	15 25.7	15 32.7	56 30.5	+2.06	56 56.1	+2.20	6 29.5	2.17	8.1
20	15 40.0	15 47.7	57 23.2	2.30	57 51.3	2.37	7 21.8	2.18	9.1
21	15 55.5	16 3.4	58 20.0	2.40	58 48.9	2.39	8 14.2	2.19	10.1
22	16 11.1	16 18.5	59 17.3	+2.32	59 44.6	+2.20	9 6.9	2.20	11.1
23	16 25.5	16 31.7	60 10.1	2.02	60 33.0	1.77	10 0.1	2.23	12.1
24	16 37.1	16 41.3	60 52.6	1.47	61 8.3	1.12	10 54.1	2.28	13.1
25	16 44.4	16 46.1	61 19.5	+0.73	61 25.8	+0.31	11 49.5	2.35	14.1
26	16 46.4	16 45.4	61 27.0	−0.11	61 23.1	−0.53	12 46.7	2.43	15.1
27	16 42.9	16 39.2	61 14.2	0.94	61 0.6	1.30	13 45.7	2.49	16.1
28	16 31.4	16 28.6	60 42.9	−1.62	60 21.7	−1.88	14 45.8	2.51	17.1
29	16 22.1	16 15.0	59 57.7	2.09	59 31.5	2.24	15 45.6	2.47	18.1
30	16 7.5	15 59.7	59 3.9	2.33	58 35.5	2.37	16 43.8	2.37	19.1
31	15 52.0	15 44.3	58 7.0	−2.36	57 38.9	−2.31	17 39.1	2.23	20.1

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	17 1 17.30	2.4821	S. 18 47 21.6	5.566
1	17 3 46.22	2.4819	18 52 51.7	5.437
2	17 6 15.13	2.4817	18 58 14.0	5.307
3	17 8 44.03	2.4815	19 3 28.5	5.177
4	17 11 12.91	2.4811	19 8 35.2	5.047
5	17 13 41.76	2.4807	19 13 34.1	4.916
6	17 16 10.59	2.4802	19 18 25.1	4.784
7	17 18 39.39	2.4797	19 23 8.2	4.653
8	17 21 8.15	2.4791	19 27 43.5	4.522
9	17 23 36.88	2.4785	19 32 10.9	4.391
10	17 26 5.57	2.4777	19 36 30.4	4.259
11	17 28 34.21	2.4769	19 40 42.0	4.127
12	17 31 2.80	2.4761	19 44 45.6	3.994
13	17 33 31.34	2.4752	19 48 41.3	3.862
14	17 35 59.82	2.4742	19 52 29.1	3.730
15	17 38 28.24	2.4731	19 56 8.9	3.597
16	17 40 56.59	2.4720	19 59 40.8	3.465
17	17 43 24.88	2.4709	20 3 4.7	3.332
18	17 45 53.10	2.4697	20 6 20.7	3.200
19	17 48 21.24	2.4683	20 9 28.7	3.067
20	17 50 49.29	2.4668	20 12 28.8	2.935
21	17 53 17.26	2.4654	20 15 20.9	2.802
22	17 55 45.14	2.4639	20 18 5.0	2.669
23	17 58 12.93	2.4623	S. 20 20 41.2	2.537

MONDAY 2.

0	18 0 40.62	2.4607	S. 20 23 9.5	2.406
1	18 3 8.21	2.4589	20 25 29.9	2.273
2	18 5 35.69	2.4571	20 27 42.3	2.141
3	18 8 3.06	2.4552	20 29 46.8	2.009
4	18 10 30.32	2.4534	20 31 43.4	1.877
5	18 12 57.47	2.4515	20 33 32.1	1.746
6	18 15 24.50	2.4494	20 35 12.9	1.615
7	18 17 51.40	2.4472	20 36 45.9	1.484
8	18 20 18.17	2.4450	20 38 11.0	1.353
9	18 22 44.80	2.4427	20 39 28.2	1.222
10	18 25 11.29	2.4404	20 40 37.6	1.092
11	18 27 37.65	2.4381	20 41 39.3	0.963
12	18 30 3.87	2.4357	20 42 33.2	0.833
13	18 32 29.94	2.4332	20 43 19.3	0.704
14	18 34 55.85	2.4306	20 43 57.7	0.575
15	18 37 21.61	2.4280	20 44 28.3	0.446
16	18 39 47.21	2.4253	20 44 51.2	0.318
17	18 42 12.64	2.4225	20 45 6.5	0.191
18	18 44 37.91	2.4197	20 45 14.1	− 0.064
19	18 47 3.01	2.4168	20 45 14.1	+ 0.063
20	18 49 27.93	2.4139	20 45 6.5	0.190
21	18 51 52.68	2.4110	20 44 51.3	0.316
22	18 54 17.25	2.4080	20 44 28.6	0.441
23	18 56 41.64	2.4049	20 43 58.4	0.566
24	18 59 5.84	2.4018	S. 20 43 20.7	0.690

TUESDAY 3.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	18 59 5.84	2.4018	S. 20 43 20.7	0.690
1	19 1 29.85	2.3986	20 42 35.6	0.813
2	19 3 53.67	2.3953	20 41 43.1	0.937
3	19 6 17.29	2.3920	20 40 43.1	1.061
4	19 8 40.71	2.3887	20 39 35.8	1.183
5	19 11 3.93	2.3853	20 38 21.2	1.304
6	19 13 26.94	2.3818	20 36 59.3	1.426
7	19 15 49.75	2.3783	20 35 30.1	1.547
8	19 18 12.34	2.3748	20 33 53.7	1.666
9	19 20 34.72	2.3712	20 32 10.2	1.784
10	19 22 56.88	2.3675	20 30 19.6	1.903
11	19 25 18.82	2.3638	20 28 21.9	2.021
12	19 27 40.54	2.3601	20 26 17.1	2.138
13	19 30 2.04	2.3564	20 24 5.3	2.255
14	19 32 23.31	2.3526	20 21 46.5	2.371
15	19 34 44.35	2.3487	20 19 20.8	2.486
16	19 37 5.16	2.3448	20 16 48.2	2.601
17	19 39 25.73	2.3409	20 14 8.7	2.715
18	19 41 46.07	2.3370	20 11 22.4	2.828
19	19 44 6.17	2.3330	20 8 29.3	2.941
20	19 46 26.03	2.3290	20 5 29.5	3.052
21	19 48 45.65	2.3250	20 2 23.1	3.162
22	19 51 5.03	2.3209	19 59 10.0	3.272
23	19 53 24.16	2.3167	S. 19 55 50.4	3.382

WEDNESDAY 4.

0	19 55 43.04	2.3126	S. 19 52 24.2	3.491
1	19 58 1.67	2.3084	19 48 51.5	3.599
2	20 0 20.05	2.3042	19 45 12.4	3.706
3	20 2 38.18	2.3000	19 41 26.8	3.813
4	20 4 56.05	2.2957	19 37 34.9	3.918
5	20 7 13.67	2.2915	19 33 36.7	4.023
6	20 9 31.03	2.2872	19 29 32.2	4.127
7	20 11 48.13	2.2829	19 25 21.5	4.229
8	20 14 4.97	2.2786	19 21 4.7	4.331
9	20 16 21.56	2.2742	19 16 41.8	4.433
10	20 18 37.88	2.2698	19 12 12.8	4.534
11	20 20 53.94	2.2654	19 7 37.7	4.635
12	20 23 9.73	2.2610	19 2 56.6	4.734
13	20 25 25.26	2.2567	18 58 9.6	4.832
14	20 27 40.53	2.2523	18 53 16.8	4.929
15	20 29 55.53	2.2478	18 48 18.2	5.025
16	20 32 10.26	2.2433	18 43 13.8	5.121
17	20 34 24.73	2.2389	18 38 3.7	5.216
18	20 36 38.93	2.2344	18 32 47.9	5.310
19	20 38 52.86	2.2299	18 27 26.5	5.403
20	20 41 6.52	2.2255	18 21 59.5	5.496
21	20 43 19.92	2.2211	18 16 27.0	5.587
22	20 45 33.05	2.2166	18 10 49.0	5.677
23	20 47 45.91	2.2120	18 5 5.7	5.767
24	20 49 58.49	2.2074	S. 17 59 17.0	5.856

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	THURSDAY 5.			
	h m s	s	° ′ ″	″
0	20 49 58.49	2.2074	S. 17 59 17.0	5.856
1	20 52 10.80	2.2030	17 53 23.0	5.943
2	20 54 22.85	2.1986	17 47 23.8	6.030
3	20 56 34.63	2.1941	17 41 19.4	6.117
4	20 58 46.14	2.1896	17 35 9.8	6.203
5	21 0 57.38	2.1852	17 28 55.0	6.288
6	21 3 8.36	2.1807	17 22 35.2	6.372
7	21 5 19.07	2.1762	17 16 10.4	6.454
8	21 7 29.51	2.1717	17 9 40.7	6.536
9	21 9 39.68	2.1673	17 3 6.1	6.617
10	21 11 49.59	2.1629	16 56 26.7	6.697
11	21 13 59.23	2.1584	16 49 42.5	6.777
12	21 16 8.60	2.1540	16 42 53.5	6.855
13	21 18 17.71	2.1496	16 35 59.8	6.932
14	21 20 26.56	2.1452	16 29 1.6	7.008
15	21 22 35.14	2.1408	16 21 58.8	7.084
16	21 24 43.46	2.1365	16 14 51.5	7.160
17	21 26 51.52	2.1321	16 7 39.6	7.235
18	21 28 59.31	2.1278	16 0 23.3	7.308
19	21 31 6.85	2.1235	15 53 2.7	7.380
20	21 33 14.13	2.1192	15 45 37.7	7.452
21	21 35 21.15	2.1149	15 38 8.5	7.522
22	21 37 27.92	2.1107	15 30 35.1	7.592
23	21 39 34.43	2.1064	S. 15 22 57.5	7.662
	FRIDAY 6.			
0	21 41 40.68	2.1021	S. 15 15 15.7	7.730
1	21 43 46.68	2.0979	15 7 29.9	7.797
2	21 45 52.43	2.0937	14 59 40.1	7.862
3	21 47 57.93	2.0896	14 51 46.4	7.927
4	21 50 3.18	2.0855	14 43 48.8	7.992
5	21 52 8.19	2.0814	14 35 47.3	8.057
6	21 54 12.95	2.0773	14 27 42.0	8.120
7	21 56 17.47	2.0732	14 19 32.9	8.182
8	21 58 21.74	2.0692	14 11 20.1	8.243
9	22 0 25.77	2.0652	14 3 3.7	8.303
10	22 2 29.56	2.0612	13 54 43.7	8.362
11	22 4 33.12	2.0573	13 46 20.2	8.421
12	22 6 36.44	2.0533	13 37 53.2	8.479
13	22 8 39.52	2.0494	13 29 22.7	8.537
14	22 10 42.37	2.0456	13 20 48.8	8.593
15	22 12 44.99	2.0418	13 12 11.6	8.648
16	22 14 47.38	2.0380	13 3 31.0	8.703
17	22 16 49.55	2.0342	12 54 47.2	8.757
18	22 18 51.49	2.0305	12 46 0.2	8.810
19	22 20 53.21	2.0268	12 37 10.0	8.862
20	22 22 54.71	2.0231	12 28 16.7	8.913
21	22 24 55.98	2.0194	12 19 20.4	8.963
22	22 26 57.04	2.0158	12 10 21.1	9.013
23	22 28 57.88	2.0122	12 1 18.8	9.062
24	22 30 58.51	2.0087	S. 11 52 13.6	9.110

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY 7.			
	h m s	s	° ′ ″	″
0	22 30 58.51	2.0087	S. 11 52 13.6	9.110
1	22 32 58.93	2.0052	11 43 5.6	9.158
2	22 34 59.14	2.0017	11 33 54.7	9.205
3	22 36 59.14	1.9983	11 24 41.0	9.251
4	22 38 58.94	1.9950	11 15 24.6	9.295
5	22 40 58.54	1.9916	11 6 5.6	9.338
6	22 42 57.93	1.9883	10 56 44.0	9.382
7	22 44 57.13	1.9850	10 47 19.8	9.425
8	22 46 56.13	1.9818	10 37 53.0	9.467
9	22 48 54.94	1.9786	10 28 23.8	9.508
10	22 50 53.56	1.9754	10 18 52.1	9.548
11	22 52 51.99	1.9723	10 9 18.0	9.587
12	22 54 50.23	1.9692	9 59 41.6	9.626
13	22 56 48.29	1.9662	9 50 2.9	9.664
14	22 58 46.17	1.9632	9 40 22.0	9.701
15	23 0 43.87	1.9602	9 30 38.8	9.738
16	23 2 41.39	1.9572	9 20 53.4	9.773
17	23 4 38.73	1.9543	9 11 6.0	9.808
18	23 6 35.90	1.9514	9 1 16.5	9.842
19	23 8 32.90	1.9486	8 51 25.0	9.875
20	23 10 29.74	1.9459	8 41 31.5	9.907
21	23 12 26.41	1.9432	8 31 36.1	9.939
22	23 14 22.92	1.9405	8 21 38.8	9.970
23	23 16 19.27	1.9378	S. 8 11 39.7	10.000
	SUNDAY 8.			
0	23 18 15.46	1.9352	S. 8 1 38.8	10.030
1	23 20 11.50	1.9326	7 51 36.1	10.059
2	23 22 7.38	1.9301	7 41 31.7	10.087
3	23 24 3.11	1.9277	7 31 25.7	10.114
4	23 25 58.70	1.9252	7 21 18.1	10.140
5	23 27 54.14	1.9228	7 11 8.9	10.167
6	23 29 49.44	1.9205	7 0 58.1	10.193
7	23 31 44.60	1.9182	6 50 45.8	10.217
8	23 33 39.62	1.9159	6 40 32.1	10.240
9	23 35 34.51	1.9137	6 30 17.0	10.262
10	23 37 29.26	1.9115	6 20 0.6	10.284
11	23 39 23.89	1.9094	6 9 42.9	10.306
12	23 41 18.39	1.9073	5 59 23.9	10.327
13	23 43 12.77	1.9052	5 49 3.7	10.347
14	23 45 7.02	1.9032	5 38 42.3	10.367
15	23 47 1.15	1.9012	5 28 19.7	10.386
16	23 48 55.17	1.8993	5 17 56.0	10.403
17	23 50 49.07	1.8974	5 7 31.3	10.420
18	23 52 42.86	1.8956	4 57 5.6	10.437
19	23 54 36.54	1.8938	4 46 38.9	10.452
20	23 56 30.12	1.8921	4 36 11.3	10.467
21	23 58 23.59	1.8904	4 25 42.8	10.482
22	0 0 16.96	1.8888	4 15 13.4	10.496
23	0 2 10.24	1.8872	4 4 43.3	10.509
24	0 4 3.42	1.8855	S. 3 54 12.4	10.521

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	MONDAY 9.			
	h m s	s	° ′ ″	″
0	0 4 3.42	1.8855	S. 3 54 12.4	10.521
1	0 5 56.50	1.8840	3 43 40.8	10.533
2	0 7 49.50	1.8826	3 33 8.5	10.544
3	0 9 42.41	1.8811	3 22 35.5	10.554
4	0 11 35.23	1.8797	3 12 2.0	10.563
5	0 13 27.97	1.8783	3 1 27.9	10.572
6	0 15 20.63	1.8770	2 50 53.3	10.581
7	0 17 13.21	1.8758	2 40 18.2	10.588
8	0 19 5.72	1.8746	2 29 42.7	10.595
9	0 20 58.16	1.8734	2 19 6.8	10.601
10	0 22 50.53	1.8722	2 8 30.6	10.607
11	0 24 42.83	1.8711	1 57 54.0	10.612
12	0 26 35.06	1.8700	1 47 17.1	10.616
13	0 28 27.23	1.8691	1 36 40.0	10.619
14	0 30 19.35	1.8682	1 26 2.8	10.622
15	0 32 11.41	1.8673	1 15 25.4	10.624
16	0 34 3.42	1.8664	1 4 47.9	10.626
17	0 35 55.38	1.8655	0 54 10.3	10.627
18	0 37 47.28	1.8647	0 43 32.7	10.627
19	0 39 39.14	1.8640	0 32 55.1	10.626
20	0 41 30.96	1.8633	0 22 17.6	10.625
21	0 43 22.74	1.8627	0 11 40.1	10.624
22	0 45 14.48	1.8620	S. 0 1 2.7	10.622
23	0 47 6.18	1.8614	N. 0 9 34.5	10.618
	TUESDAY 10.			
0	0 48 57.85	1.8609	N. 0 20 11.4	10.613
1	0 50 49.49	1.8604	0 30 48.1	10.609
2	0 52 41.10	1.8600	0 41 24.5	10.604
3	0 54 32.69	1.8596	0 52 0.6	10.599
4	0 56 24.25	1.8593	1 2 36.4	10.592
5	0 58 15.80	1.8590	1 13 11.7	10.585
6	1 0 7.33	1.8587	1 23 46.6	10.577
7	1 1 58.84	1.8584	1 34 21.0	10.569
8	1 3 50.34	1.8582	1 44 54.9	10.560
9	1 5 41.83	1.8581	1 55 28.2	10.550
10	1 7 33.31	1.8580	2 6 0.9	10.540
11	1 9 24.79	1.8580	2 16 33.0	10.529
12	1 11 16.27	1.8580	2 27 4.4	10.517
13	1 13 7.75	1.8580	2 37 35.1	10.505
14	1 14 59.23	1.8580	2 48 5.0	10.492
15	1 16 50.71	1.8581	2 58 34.1	10.478
16	1 18 42.20	1.8582	3 9 2.4	10.464
17	1 20 33.70	1.8584	3 19 29.8	10 450
18	1 22 25.21	1.8587	3 29 56.4	10.435
19	1 24 16.74	1.8590	3 40 22.0	10.419
20	1 26 8.29	1.8593	3 50 46.6	10.402
21	1 27 59.85	1.8596	4 1 10.2	10.384
22	1 29 51.44	1.8600	4 11 32.7	10.366
23	1 31 43.05	1.8604	4 21 54.1	10.348
24	1 33 34.69	1.8609	N. 4 32 14.4	10.329

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	WEDNESDAY 11.			
	h m s	s	° ′ ″	″
0	1 33 34.69	1.8609	N. 4 32 14.4	10.329
1	1 35 26.36	1.8614	4 42 33.6	10.309
2	1 37 18.06	1.8619	4 52 51.5	10.288
3	1 39 9.79	1.8625	5 3 8.1	10.266
4	1 41 1.56	1.8632	5 13 23.4	10.244
5	1 42 53.37	1.8638	5 23 37.4	10.222
6	1 44 45.22	1.8645	5 33 50.1	10.200
7	1 46 37.11	1.8653	5 44 1.4	10.176
8	1 48 29.05	1.8661	5 54 11.2	10.151
9	1 50 21.04	1.8669	6 4 19.5	10.126
10	1 52 13.08	1.8678	6 14 26.3	10.100
11	1 54 5.17	1.8687	6 24 31.5	10.074
12	1 55 57.32	1.8696	6 34 35.2	10.048
13	1 57 49.52	1.8705	6 44 37.3	10.021
14	1 59 41.78	1.8716	6 54 37.7	9.992
15	2 1 34.11	1.8727	7 4 36.3	9.963
16	2 3 26.50	1.8737	7 14 33.2	9.933
17	2 5 18.96	1.8748	7 24 28.3	9.903
18	2 7 11.48	1.8759	7 34 21.6	9.873
19	2 9 4.07	1.8772	7 44 13.1	9.842
20	2 10 56.74	1.8785	7 54 2.6	9.809
21	2 12 49.49	1.8797	8 3 50.2	9.776
22	2 14 42.31	1.8810	8 13 35.8	9.743
23	2 16 35.21	1.8823	N. 8 23 19.4	9.710
	THURSDAY 12.			
0	2 18 28.19	1.8837	N. 8 33 1.0	9.676
1	2 20 21.25	1.8851	8 42 40.5	9.641
2	2 22 14.40	1.8866	8 52 17.9	9.605
3	2 24 7.64	1.8881	9 1 53.1	9.568
4	2 26 0.97	1.8896	9 11 26.1	9.531
5	2 27 54.39	1.8911	9 20 56.9	9.494
6	2 29 47.90	1.8927	9 30 25.4	9.456
7	2 31 41.51	1.8943	9 39 51.6	9.417
8	2 33 35.22	1.8959	9 49 15.5	9.378
9	2 35 29.02	1.8975	9 58 37.0	9.338
10	2 37 22.92	1.8992	10 7 56.0	9.297
11	2 39 16.93	1.9010	10 17 12.6	9.256
12	2 41 11.04	1.9028	10 26 26.7	9.214
13	2 43 5.26	1.9046	10 35 38.3	9.172
14	2 44 59.59	1.9064	10 44 47.3	9.128
15	2 46 54.03	1.9083	10 53 53.7	9.084
16	2 48 48.58	1.9102	11 2 57.4	9.039
17	2 50 43.25	1.9121	11 11 58.4	8.994
18	2 52 38.03	1.9140	11 20 56.7	8.948
19	2 54 32.93	1.9160	11 29 52.2	8.903
20	2 56 27.95	1.9181	11 38 45.0	8.857
21	2 58 23.10	1.9202	11 47 35.0	8.809
22	3 0 18.37	1.9222	11 56 22.1	8.760
23	3 2 13.76	1.9242	12 5 6.2	8.711
24	3 4 9.27	1.9263	N.12 13 47.4	8.662

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	FRIDAY 13.			
	h m s	s	° ′ ″	″
0	3 4 9.27	1.9263	N.12 13 47.4	8.662
1	3 6 4.91	1.9284	12 22 25.6	8.612
2	3 8 0.68	1.9306	12 31 0.8	8.561
3	3 9 56.59	1.9329	12 39 32.9	8.509
4	3 11 52.63	1.9351	12 48 1.9	8.458
5	3 13 48.80	1.9373	12 56 27.8	8.406
6	3 15 45.10	1.9395	13 4 50.6	8.352
7	3 17 41.54	1.9418	13 13 10.1	8.298
8	3 19 38.12	1.9442	13 21 26.4	8.244
9	3 21 34.84	1.9465	13 29 39.4	8.189
10	3 23 31.70	1.9489	13 37 49.1	8.133
11	3 25 28.71	1.9513	13 45 55.4	8.077
12	3 27 25.86	1.9537	13 53 58.4	8.021
13	3 29 23.16	1.9562	14 1 57.9	7.963
14	3 31 20.60	1.9586	14 9 53.9	7.904
15	3 33 18.19	1.9611	14 17 46.4	7.846
16	3 35 15.93	1.9636	14 25 35.4	7.787
17	3 37 13.82	1.9661	14 33 20.9	7.728
18	3 39 11.86	1.9686	14 41 2.8	7.667
19	3 41 10.05	1.9712	14 48 41.0	7.606
20	3 43 8.40	1.9737	14 56 15.5	7.544
21	3 45 6.90	1.9763	15 3 46.2	7.481
22	3 47 5.56	1.9790	15 11 13.2	7.418
23	3 49 4.38	1.9816	N.15 18 36.4	7.354
	SATURDAY 14.			
0	3 51 3.35	1.9842	N.15 25 55.7	7.289
1	3 53 2.48	1.9868	15 33 11.1	7.225
2	3 55 1.77	1.9895	15 40 22.7	7.161
3	3 57 1.22	1.9922	15 47 30.4	7.095
4	3 59 0.84	1.9950	15 54 34.1	7.028
5	4 1 0.62	1.9977	16 1 33.7	6.960
6	4 3 0.56	2.0004	16 8 29.3	6.892
7	4 5 0.67	2.0032	16 15 20.8	6.823
8	4 7 0.94	2.0059	16 22 8.1	6.754
9	4 9 1.38	2.0087	16 28 51.3	6.685
10	4 11 1.98	2.0114	16 35 30.3	6.615
11	4 13 2.75	2.0142	16 42 5.1	6.544
12	4 15 3.69	2.0171	16 48 35.6	6.472
13	4 17 4.80	2.0199	16 55 1.8	6.400
14	4 19 6.08	2.0227	17 1 23.6	6.328
15	4 21 7.53	2.0255	17 7 41.1	6.255
16	4 23 9.14	2.0283	17 13 54.2	6.181
17	4 25 10.92	2.0311	17 20 2.8	6.107
18	4 27 12.87	2.0339	17 26 7.0	6.032
19	4 29 14.99	2.0368	17 32 6.6	5.956
20	4 31 17.29	2.0397	17 38 1.7	5.880
21	4 33 19.76	2.0426	17 43 52.2	5.803
22	4 35 22.40	2.0454	17 49 38.1	5.726
23	4 37 25.21	2.0483	17 55 19.3	5.649
24	4 39 28.20	2.0512	N.18 0 55.9	5.571
	SUNDAY 15.			
0	4 39 28.20	2.0512	N.18 0 55.9	5.571
1	4 41 31.36	2.0541	18 6 27.8	5.492
2	4 43 34.69	2.0569	18 11 54.9	5.411
3	4 45 38.19	2.0598	18 17 17.1	5.330
4	4 47 41.86	2.0627	18 22 34.5	5.250
5	4 49 45.71	2.0656	18 27 47.1	5.169
6	4 51 49.73	2.0684	18 32 54.8	5.087
7	4 53 53.92	2.0713	18 37 57.6	5.005
8	4 55 58.28	2.0742	18 42 55.4	4.922
9	4 58 2.82	2.0771	18 47 48.2	4.838
10	5 0 7.53	2.0799	18 52 36.0	4.754
11	5 2 12.41	2.0828	18 57 18.7	4.669
12	5 4 17.47	2.0857	19 1 56 3	4.584
13	5 6 22.70	2.0886	19 6 28.8	4.498
14	5 8 28.10	2.0914	19 10 56.1	4.413
15	5 10 33.67	2.0942	19 15 18.3	4.327
16	5 12 39.40	2.0969	19 19 35.3	4.239
17	5 14 45.30	2.0997	19 23 47.0	4.151
18	5 16 51.37	2.1026	19 27 53.4	4.062
19	5 18 57.61	2.1054	19 31 54.5	3.973
20	5 21 4.02	2.1082	19 35 50.2	3.884
21	5 23 10.60	2.1110	19 39 40.6	3.795
22	5 25 17.34	2.1138	19 43 25.6	3.704
23	5 27 24.25	2.1166	N.19 47 5.1	3.613
	MONDAY 16.			
0	5 29 31.33	2.1193	N.19 50 39.1	3.521
1	5 31 38.57	2.1220	19 54 7.6	3.429
2	5 33 45.97	2.1247	19 57 30.6	3.337
3	5 35 53.54	2.1275	20 0 48.1	3.245
4	5 38 1.27	2.1302	20 4 0.0	3.152
5	5 40 9.16	2.1329	20 7 6.3	3.058
6	5 42 17.22	2.1356	20 10 6.9	2.963
7	5 44 25.44	2.1382	20 13 1.9	2.868
8	5 46 33.81	2.1408	20 15 51.1	2.773
9	5 48 42.34	2.1435	20 18 34.6	2.677
10	5 50 51.03	2.1461	20 21 12.3	2.580
11	5 52 59.87	2.1486	20 23 44.2	2.484
12	5 55 8.86	2.1512	20 26 10.4	2 387
13	5 57 18.01	2.1538	20 28 30.7	2.289
14	5 59 27.31	2.1563	20 30 45.1	2.191
15	6 1 36.76	2.1588	20 32 53.7	2.093
16	6 3 46.36	2.1613	20 34 56.3	1.994
17	6 5 56.11	2.1638	20 36 53.0	1.896
18	6 8 6.01	2.1663	20 38 43.8	1.797
19	6 10 16.06	2.1687	20 40 28.6	1.696
20	6 12 26.25	2.1710	20 42 7.3	1.595
21	6 14 36.58	2.1733	20 43 40.0	1.494
22	6 16 47.05	2.1757	20 45 6.6	1.393
23	6 18 57.66	2.1780	20 46 27.1	1.292
24	6 21 8.41	2.1803	N.20 47 41.6	1.190

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	TUESDAY 17.			
	h m s	s	° ′ ″	″
0	6 21 8.41	2.1803	N.20 47 41.6	1.190
1	6 23 19.30	2.1826	20 48 49.9	1.087
2	6 25 30.32	2.1848	20 49 52.1	0.985
3	6 27 41.48	2.1871	20 50 48.1	0.882
4	6 29 52.77	2.1893	20 51 37.9	0.778
5	6 32 4.19	2.1914	20 52 21.5	0.674
6	6 34 15.74	2.1936	20 52 58.8	0.570
7	6 36 27.42	2.1957	20 53 29.9	0.466
8	6 38 39.22	2.1977	20 53 54.7	0.361
9	6 40 51.15	2.1998	20 54 13.2	0.256
10	6 43 3.20	2.2018	20 54 25.4	0.151
11	6 45 15.37	2.2038	20 54 31.3	+0.046
12	6 47 27.66	2.2058	20 54 30.9	−0.060
13	6 49 40.07	2.2078	20 54 24.1	0.167
14	6 51 52.59	2.2097	20 54 10.9	0.273
15	6 54 5.23	2.2116	20 53 51.3	0.380
16	6 56 17.98	2.2134	20 53 25.3	0.487
17	6 58 30.84	2.2152	20 52 52.8	0.595
18	7 0 43.80	2.2169	20 52 13.9	0.702
19	7 2 56.87	2.2187	20 51 28.5	0.810
20	7 5 10.05	2.2205	20 50 36.7	0.918
21	7 7 23.33	2.2222	20 49 38.4	1.026
22	7 9 36.72	2.2239	20 48 33.6	1.134
23	7 11 50.20	2.2255	N.20 47 22.3	1.242
	WEDNESDAY 18.			
0	7 14 3.78	2.2272	N.20 46 4.5	1.351
1	7 16 17.46	2.2288	20 44 40.2	1.460
2	7 18 31.23	2.2303	20 43 9.3	1.570
3	7 20 45.09	2.2318	20 41 31.8	1.680
4	7 22 59.04	2.2333	20 39 47.7	1.789
5	7 25 13.08	2.2347	20 37 57.1	1.898
6	7 27 27.20	2.2361	20 35 59.9	2.008
7	7 29 41.41	2.2375	20 33 56.1	2.118
8	7 31 55.70	2.2389	20 31 45.7	2.228
9	7 34 10.08	2.2402	20 29 28.7	2.338
10	7 36 24.53	2.2415	20 27 5.1	2.448
11	7 38 39.06	2.2427	20 24 34.9	2.559
12	7 40 53.66	2.2439	20 21 58.0	2.670
13	7 43 8.33	2.2452	20 19 14.5	2.780
14	7 45 23.08	2.2464	20 16 24.4	2.891
15	7 47 37.90	2.2476	20 13 27.6	3.002
16	7 49 52.79	2.2487	20 10 24.2	3.112
17	7 52 7.74	2.2497	20 7 14.2	3.222
18	7 54 22.76	2.2508	20 3 57.5	3.333
19	7 56 37.84	2.2518	20 0 34.2	3.444
20	7 58 52.98	2.2528	19 57 4.2	3.555
21	8 1 8.18	2.2538	19 53 27.6	3.666
22	8 3 23.44	2.2547	19 49 44.3	3.777
23	8 5 38.75	2.2556	19 45 54.4	3.887
24	8 7 54.11	2.2565	N.19 41 57.9	3.997

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	THURSDAY 19.			
	h m s	s	° ′ ″	″
0	8 7 54.11	2.2565	N.19 41 57.9	3.997
1	8 10 9.53	2.2574	19 37 54.7	4.108
2	8 12 25.00	2.2582	19 33 44.9	4.218
3	8 14 40.51	2.2589	19 29 28.5	4.329
4	8 16 56.07	2.2597	19 25 5.4	4.440
5	8 19 11.68	2.2605	19 20 35.7	4.550
6	8 21 27.33	2.2612	19 15 59.4	4.660
7	8 23 43.03	2.2620	19 11 16.5	4.770
8	8 25 58.77	2.2627	19 6 27.0	4.881
9	8 28 14.55	2.2633	19 1 30.8	4.991
10	8 30 30.37	2.2639	18 56 28.1	5.100
11	8 32 46.22	2.2645	18 51 18.8	5.209
12	8 35 2.11	2.2651	18 46 3.0	5.318
13	8 37 18.03	2.2656	18 40 40.6	5.427
14	8 39 33.98	2.2662	18 35 11.7	5.537
15	8 41 49.97	2.2667	18 29 36.2	5.646
16	8 44 5.99	2.2672	18 23 54.2	5.754
17	8 46 22.04	2.2677	18 18 5.7	5.863
18	8 48 38.11	2.2681	18 12 10.7	5.971
19	8 50 54.21	2.2685	18 6 9.2	6.078
20	8 53 10.33	2.2689	18 0 1.3	6.186
21	8 55 26.48	2.2693	17 53 46.9	6.293
22	8 57 42.65	2.2698	17 47 26.1	6.400
23	8 59 58.85	2.2702	N.17 40 58.9	6.507
	FRIDAY 20.			
0	9 2 15.07	2.2705	N.17 34 25.2	6.614
1	9 4 31.31	2.2708	17 27 45.2	6.720
2	9 6 47.57	2.2711	17 20 58.8	6.826
3	9 9 3.84	2.2714	17 14 6.1	6.931
4	9 11 20.13	2.2717	17 7 7.1	7.036
5	9 13 36.44	2.2720	17 0 1.8	7.141
6	9 15 52.77	2.2722	16 52 50.2	7.245
7	9 18 9.11	2.2725	16 45 32.4	7.348
8	9 20 25.47	2.2728	16 38 8.4	7.452
9	9 22 41.85	2.2731	16 30 38.1	7.556
10	9 24 58.24	2.2733	16 23 1.7	7.659
11	9 27 14.64	2.2734	16 15 19.1	7.761
12	9 29 31.05	2.2736	16 7 30.4	7.862
13	9 31 47.47	2.2738	15 59 35.6	7.963
14	9 34 3.91	2.2741	15 51 34.8	8.064
15	9 36 20.36	2.2743	15 43 27.9	8.165
16	9 38 36.82	2.2744	15 35 15.0	8.265
17	9 40 53.29	2.2747	15 26 56.1	8.364
18	9 43 9.78	2.2749	15 18 31.3	8.463
19	9 45 26.28	2.2750	15 10 0.6	8.561
20	9 47 42.78	2.2751	15 1 24.0	8.658
21	9 49 59.29	2.2753	14 52 41.6	8.755
22	9 52 15.81	2.2755	14 43 53.4	8.852
23	9 54 32.35	2.2757	14 34 59.4	8.948
24	9 56 48.90	2.2758	N.14 25 59.6	9.044

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY 21.			
	h m s	s	° ′ ″	″
0	9 56 48.90	2.2758	N.14 25 59.6	9.044
1	9 59 5.45	2.2760	14 16 54.1	9.138
2	10 1 22.02	2.2762	14 7 43.0	9.232
3	10 3 38.60	2.2764	13 58 26.3	9.325
4	10 5 55.19	2.2766	13 49 4.0	9.417
5	10 8 11.79	2.2768	13 39 36.2	9.510
6	10 10 28.41	2.2771	13 30 2.8	9.602
7	10 12 45.04	2.2773	13 20 24.0	9.692
8	10 15 1.68	2.2774	13 10 39.7	9.782
9	10 17 18.33	2.2777	13 0 50.1	9.871
10	10 19 35.00	2.2779	12 50 55.2	9.959
11	10 21 51.68	2.2781	12 40 55.0	10.047
12	10 24 8.37	2.2783	12 30 49.5	10.135
13	10 26 25.08	2.2786	12 20 38.8	10.221
14	10 28 41.81	2.2789	12 10 23.0	10.306
15	10 30 58.55	2.2792	12 0 2.1	10.390
16	10 33 15.31	2.2795	11 49 36.2	10.474
17	10 35 32.09	2.2798	11 39 5.3	10.557
18	10 37 48.89	2.2802	11 28 29.4	10.639
19	10 40 5.71	2.2805	11 17 48.6	10 720
20	10 42 22.55	2.2808	11 7 3.0	10.800
21	10 44 39.41	2.2812	10 56 12.6	10.879
22	10 46 56.30	2.2817	10 45 17.5	10.957
23	10 49 13.21	2.2821	N.10 34 17.7	11.035
	SUNDAY 22.			
0	10 51 30.15	2.2825	N.10 23 13.3	11.111
1	10 53 47.11	2.2829	10 12 4.4	11.187
2	10 56 4.10	2.2834	10 0 50.9	11.263
3	10 58 21.12	2.2839	9 49 32.9	11.337
4	11 0 38.17	2.2844	9 38 10.5	11.409
5	11 2 55.25	2.2849	9 26 43.8	11.480
6	11 5 12.36	2.2855	9 15 12.9	11.550
7	11 7 29.51	2.2861	9 3 37.8	11.620
8	11 9 46.69	2.2867	8 51 58.5	11.689
9	11 12 3.91	2.2873	8 40 15.1	11.757
10	11 14 21.17	2.2880	8 28 27.7	11.823
11	11 16 38.47	2.2887	8 16 36.4	11.888
12	11 18 55.81	2.2894	8 4 41.2	11.952
13	11 21 13.19	2.2901	7 52 42.2	12.015
14	11 23 30.62	2.2908	7 40 39.4	12.077
15	11 25 48.09	2.2916	7 28 32.9	12.138
16	11 28 5.61	2.2924	7 16 22.8	12.197
17	11 30 23.18	2.2933	7 4 9.2	12.255
18	11 32 40.81	2.2942	6 51 52.2	12.312
19	11 34 58.49	2.2951	6 39 31.8	12.368
20	11 37 16.22	2.2960	6 27 8.0	12.424
21	11 39 34.01	2.2969	6 14 40.9	12.478
22	11 41 51.85	2.2979	6 2 10.6	12.530
23	11 44 9.76	2.2990	5 49 37.3	12.580
24	11 46 27.73	2.3000	N. 5 37 1.0	12.630

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	MONDAY 23.			
	h m s	s	° ′ ″	″
0	11 46 27.73	2.3000	N. 5 37 1.0	12.630
1	11 48 45.76	2.3011	5 24 21.7	12.678
2	11 51 3.86	2.3022	5 11 39.6	12.725
3	11 53 22.03	2.3034	4 58 54.7	12.771
4	11 55 40.27	2.3046	4 46 7.1	12.816
5	11 57 58.58	2.3058	4 33 16.8	12.859
6	12 0 16.96	2.3070	4 20 24.0	12.901
7	12 2 35.42	2.3083	4 7 28.7	12.942
8	12 4 53.96	2.3096	3 54 31.0	12.980
9	12 7 12.57	2.3109	3 41 31.1	13.017
10	12 9 31.27	2.3123	3 28 29.0	13.053
11	12 11 50.05	2.3137	3 15 24.7	13.089
12	12 14 8.91	2.3151	3 2 18.3	13.122
13	12 16 27.86	2.3166	2 49 10.0	13.154
14	12 18 46.90	2.3182	2 35 59.8	13.184
15	12 21 6.04	2.3197	2 22 47.9	13.212
16	12 23 25.27	2.3213	2 9 34.3	13.240
17	12 25 44.60	2.3230	1 56 19.1	13.267
18	12 28 4.03	2.3247	1 43 2.3	13.292
19	12 30 23.56	2.3263	1 29 44.1	13.314
20	12 32 43.19	2.3280	1 16 24.6	13.335
21	12 35 2.92	2.3298	1 3 3.9	13.355
22	12 37 22.76	2.3316	0 49 42.0	13.373
23	12 39 42.71	2.3333	N. 0 36 19.1	13.390
	TUESDAY 24.			
0	12 42 2.76	2.3352	N. 0 22 55.2	13.405
1	12 44 22.93	2.3372	N. 0 9 30.5	13.418
2	12 46 43.22	2.3391	S. 0 3 55.0	13.431
3	12 49 3.62	2.3410	0 17 21.2	13.442
4	12 51 24.14	2.3430	0 30 48.0	13.450
5	12 53 44.78	2.3451	0 44 15.2	13.457
6	12 56 5.55	2.3472	0 57 42.8	13.462
7	12 58 26.44	2.3493	1 11 10.7	13.466
8	13 0 47.46	2.3514	1 24 38.7	13.467
9	13 3 8.61	2.3536	1 38 6.8	13.468
10	13 5 29.89	2.3557	1 51 34.9	13.467
11	13 7 51.30	2.3580	2 5 2.9	13.464
12	13 10 12.85	2.3603	2 18 30.6	13.459
13	13 12 34.54	2.3626	2 31 58.0	13.453
14	13 14 56.36	2.3649	2 45 25.0	13.445
15	13 17 18.32	2.3673	2 58 51.4	13.435
16	13 19 40.43	2.3697	3 12 17.2	13.424
17	13 22 2.68	2.3720	3 25 42.3	13.411
18	13 24 25.07	2.3744	3 39 6.5	13.396
19	13 26 47.61	2.3769	3 52 29.8	13.379
20	13 29 10.30	2.3795	4 5 52.0	13.361
21	13 31 33.15	2.3821	4 19 13.1	13.341
22	13 33 56.15	2.3846	4 32 32.9	13.318
23	13 36 19.30	2.3871	4 45 51.3	13.295
24	13 38 42.60	2.3897	S. 4 59 8.3	13.270

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 25.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	13 38 42.60	2.3897	S. 4 59 8.3	13.270
1	13 41 6.06	2.3923	5 12 23.7	13.242
2	13 43 29.68	2.3950	5 25 37.4	13.213
3	13 45 53.46	2.3977	5 38 49.3	13.182
4	13 48 17.40	2.4004	5 51 59.3	13.150
5	13 50 41.50	2.4031	6 5 7.3	13.116
6	13 53 5.77	2.4058	6 18 13.2	13.080
7	13 55 30.20	2.4086	6 31 16.9	13.042
8	13 57 54.80	2.4113	6 44 18.3	13.002
9	14 0 19.56	2.4141	6 57 17.2	12.961
10	14 2 44.49	2.4169	7 10 13.6	12.917
11	14 5 9.59	2.4197	7 23 7.3	12.872
12	14 7 34.85	2.4225	7 35 58.3	12.826
13	14 10 0.29	2.4254	7 48 46.4	12.777
14	14 12 25.90	2.4282	8 1 31.6	12.727
15	14 14 51.68	2.4311	8 14 13.7	12.675
16	14 17 17.63	2.4340	8 26 52.6	12.622
17	14 19 43.76	2.4369	8 39 28.3	12.567
18	14 22 10.06	2.4398	8 52 0.6	12.509
19	14 24 36.53	2.4427	9 4 29.4	12.450
20	14 27 3.18	2.4456	9 16 54.6	12.389
21	14 29 30.00	2.4485	9 29 16.1	12.326
22	14 31 57.00	2.4514	9 41 33.7	12.261
23	14 34 24.17	2.4543	S. 9 53 47.4	12.195

THURSDAY 26.

0	14 36 51.51	2.4572	S. 10 5 57.1	12.127
1	14 39 19.03	2.4601	10 18 2.7	12.058
2	14 41 46.72	2.4630	10 30 4.1	11.987
3	14 44 14.59	2.4659	10 42 1.2	11.914
4	14 46 42.63	2.4688	10 53 53.8	11.839
5	14 49 10.84	2.4717	11 5 41.9	11.763
6	14 51 39.23	2.4746	11 17 25.4	11.686
7	14 54 7.79	2.4774	11 29 4.2	11.607
8	14 56 36.52	2.4803	11 40 38.2	11.525
9	14 59 5.43	2.4831	11 52 7.2	11.442
10	15 1 34.50	2.4859	12 3 31.2	11.357
11	15 4 3.74	2.4887	12 14 50.1	11.271
12	15 6 33.15	2.4915	12 26 3.7	11.183
13	15 9 2.72	2.4943	12 37 12.0	11.093
14	15 11 32.46	2.4971	12 48 14.9	11.003
15	15 14 2.37	2.4998	12 59 12.3	10.911
16	15 16 32.44	2.5025	13 10 4.2	10.817
17	15 19 2.67	2.5052	13 20 50.4	10.722
18	15 21 33.06	2.5078	13 31 30.8	10.624
19	15 24 3.61	2.5104	13 42 5.3	10.526
20	15 26 34.31	2.5129	13 52 33.9	10.426
21	15 29 5.16	2.5155	14 2 56.4	10.324
22	15 31 36.17	2.5181	14 13 12.8	10.221
23	15 34 7.33	2.5205	14 23 22.9	10.116
24	15 36 38.63	2.5229	S. 14 33 26.7	10.010

FRIDAY 27.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	15 36 38.63	2.5229	S. 14 33 26.7	10.010
1	15 39 10.08	2.5253	14 43 24.1	9.903
2	15 41 41.67	2.5277	14 53 15.1	9.795
3	15 44 13.40	2.5300	15 2 59.5	9.685
4	15 46 45.27	2.5322	15 12 37.3	9.574
5	15 49 17.27	2.5345	15 22 8.4	9.462
6	15 51 49.41	2.5367	15 31 32.8	9.349
7	15 54 21.68	2.5388	15 40 50.3	9.233
8	15 56 54.07	2.5408	15 50 0.8	9.117
9	15 59 26.58	2.5428	15 59 4.3	8.999
10	16 1 59.21	2.5448	16 8 0.7	8.881
11	16 4 31.96	2.5467	16 16 50.0	8.761
12	16 7 4.82	2.5486	16 25 32.0	8.639
13	16 9 37.79	2.5504	16 34 6.7	8.517
14	16 12 10.86	2.5521	16 42 34.1	8.395
15	16 14 44.04	2.5537	16 50 54.1	8.271
16	16 17 17.31	2.5553	16 59 6.6	8.146
17	16 19 50.68	2.5569	17 7 11.6	8.019
18	16 22 24.14	2.5584	17 15 8.9	7.891
19	16 24 57.69	2.5597	17 22 58.5	7.763
20	16 27 31.31	2.5610	17 30 40.5	7.635
21	16 30 5.01	2.5622	17 38 14.7	7.504
22	16 32 38.78	2.5634	17 45 41.0	7.373
23	16 35 12.62	2.5646	S. 17 52 59.4	7.241

SATURDAY 28.

0	16 37 46.53	2.5657	S. 18 0 9.9	7.108
1	16 40 20.50	2.5666	18 7 12.4	6.975
2	16 42 54.52	2.5674	18 14 6.9	6.841
3	16 45 28.59	2.5682	18 20 53.3	6.706
4	16 48 2.71	2.5690	18 27 31.6	6.570
5	16 50 36.87	2.5696	18 34 1.7	6.434
6	16 53 11.06	2.5701	18 40 23.7	6.297
7	16 55 45.28	2.5706	18 46 37.4	6.159
8	16 58 19.53	2.5710	18 52 42.8	6.021
9	17 0 53.80	2.5712	18 58 39.9	5.882
10	17 3 28.08	2.5714	19 4 28.7	5.743
11	17 6 2.37	2.5716	19 10 9.1	5.603
12	17 8 36.67	2.5716	19 15 41.1	5.463
13	17 11 10.96	2.5715	19 21 4.7	5.322
14	17 13 45.25	2.5714	19 26 19.8	5.181
15	17 16 19.53	2.5712	19 31 26.4	5.039
16	17 18 53.79	2.5708	19 36 24.5	4.897
17	17 21 28.03	2.5704	19 41 14.1	4.755
18	17 24 2.24	2.5698	19 45 55.1	4.612
19	17 26 36.41	2.5692	19 50 27.6	4.470
20	17 29 10.55	2.5686	19 54 51.5	4.327
21	17 31 44.64	2.5678	19 59 6.8	4.183
22	17 34 18.68	2.5668	20 3 13.5	4.040
23	17 36 52.66	2.5658	20 7 11.6	3.897
24	17 39 26.58	2.5648	S. 20 11 1.1	3.753

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SUNDAY 29.			
	h m s	s	° ′ ″	″
0	17 39 26.58	2.5648	S. 20 11 1.1	3.753
1	17 42 0.44	2.5637	20 14 42.0	3.609
2	17 44 34.22	2.5623	20 18 14.2	3.465
3	17 47 7.92	2.5609	20 21 37.8	3.321
4	17 49 41.53	2.5595	20 24 52.7	3.177
5	17 52 15.06	2.5580	20 27 59.0	3.033
6	17 54 48.49	2.5563	20 30 56.7	2.890
7	17 57 21.82	2.5546	20 33 45.8	2.746
8	17 59 55.04	2.5527	20 36 26.2	2.602
9	18 2 28.15	2.5508	20 38 58.0	2.458
10	18 5 1.14	2.5488	20 41 21.2	2.315
11	18 7 34.01	2.5467	20 43 35.8	2.172
12	18 10 6.75	2.5445	20 45 41.9	2.030
13	18 12 39.35	2.5422	20 47 39.4	1.887
14	18 15 11.82	2.5399	20 49 28.3	1.744
15	18 17 44.14	2.5373	20 51 8.6	1.601
16	18 20 16.30	2.5347	20 52 40.4	1.459
17	18 22 48.31	2.5321	20 54 3.7	1.318
18	18 25 20.16	2.5294	20 55 18.6	1.177
19	18 27 51.84	2.5266	20 56 25.0	1.036
20	18 30 23.35	2.5237	20 57 22.9	0.895
21	18 32 54.68	2.5207	20 58 12.4	0.755
22	18 35 25.83	2.5176	20 58 53.5	0.616
23	18 37 56.79	2.5144	S. 20 59 26.3	0.477
	MONDAY 30.			
0	18 40 27.55	2.5111	S. 20 59 50.8	0.339
1	18 42 58.12	2.5078	21 0 7.0	0.201
2	18 45 28.49	2.5044	21 0 14.9	−0.063
3	18 47 58.65	2.5009	21 0 14.5	+0.075
4	18 50 28.60	2.4973	21 0 5.9	0.211
5	18 52 58.33	2.4937	20 59 49.2	0.346
6	18 55 27.84	2.4900	20 59 24.4	0.481
7	18 57 57.13	2.4862	20 58 51.5	0.616
8	19 0 26.18	2.4823	20 58 10.5	0.750
9	19 2 55.00	2.4783	20 57 21.5	0.883
10	19 5 23.58	2.4743	20 56 24.5	1.016
11	19 7 51.92	2.4703	20 55 19.6	1.147
12	19 10 20.02	2.4662	20 54 6.9	1.277
13	19 12 47.87	2.4620	20 52 46.4	1.408
14	19 15 15.46	2.4577	20 51 18.0	1.538
15	19 17 42.79	2.4533	20 49 41.8	1.667
16	19 20 9.86	2.4489	20 47 57.9	1.795
17	19 22 36.66	2.4445	20 46 6.4	1.922
18	19 25 3.20	2.4400	20 44 7.3	2.048
19	19 27 29.46	2.4354	20 42 0.6	2.174
20	19 29 55.45	2.4308	20 39 46.4	2.298
21	19 32 21.16	2.4261	20 37 24.8	2.422
22	19 34 46.59	2.4214	20 34 55.8	2.545
23	19 37 11.73	2.4167	20 32 19.4	2.667
24	19 39 36.59	2.4119	S. 20 29 35.7	2.788

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	TUESDAY, MAY 1.			
	h m s	s	° ′ ″	″
0	19 39 36.59	2.4119	S. 20 29 35.7	2.788

PHASES OF THE MOON.

		d	h	m
☾	Last Quarter. . April	3	0	41.2
●	New Moon	10	21	7.7
☽	First Quarter . . .	18	23	52.4
○	Full Moon	25	18	22.2

		d	h
☾	Apogee. . . . April	12	11.0
☾	Perigee.	25	20.8

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	III^h.	P. L. of Diff.	VI^h.	P. L. of Diff.	IX^h.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
1	Spica	W.	54 6 14	2312	55 51 56	2326	57 37 18	2339	59 22 21	2353
	Mars	W.	50 42 21	2170	52 31 33	2185	54 20 23	2200	56 8 51	2214
	α Aquilæ	E.	48 49 8	3417	47 27 11	3501	46 6 48	3593	44 48 6	3693
	Fomalhaut	E.	78 37 24	2517	76 56 35	2536	75 16 12	2556	73 36 16	2576
	Venus	E.	89 41 10	2657	88 3 32	2672	86 26 15	2689	84 49 21	2707
	α Pegasi	E.	94 10 7	2623	92 31 43	2638	90 53 39	2652	89 15 55	2668
	Sun	E.	116 2 30	2593	114 23 25	2609	112 44 42	2625	111 6 21	2641
2	Spica	W.	68 2 29	2425	69 45 28	2440	71 28 6	2455	73 10 22	2470
	Mars	W.	65 5 46	2288	66 52 3	2303	68 37 58	2318	70 23 32	2333
	Jupiter	W.	24 4 5	2423	25 47 7	2433	27 29 55	2443	29 12 28	2455
	Antares	W.	23 13 31	2728	24 49 34	2701	26 26 12	2684	28 3 14	2671
	Fomalhaut	E.	65 23 50	2688	63 46 54	2713	62 10 31	2738	60 34 41	2764
	Venus	E.	76 50 32	2792	75 15 54	2810	73 41 39	2828	72 7 47	2845
	α Pegasi	E.	81 12 49	2756	79 37 24	2777	78 2 26	2798	76 27 55	2818
	Sun	E.	103 0 8	2724	101 24 0	2741	99 48 14	2758	98 12 51	2775
3	Spica	W.	81 36 28	2545	83 16 39	2560	84 56 29	2574	86 35 59	2590
	Mars	W.	79 5 57	2406	80 49 23	2421	82 32 28	2435	84 15 13	2448
	Jupiter	W.	37 40 49	2521	39 21 33	2535	41 1 59	2548	42 42 6	2561
	Antares	W.	36 10 50	2661	37 48 22	2665	39 25 49	2671	41 3 8	2678
	Fomalhaut	E.	52 44 43	2915	51 12 43	2950	49 41 27	2986	48 10 57	3024
	Venus	E.	64 23 57	2930	62 52 16	2946	61 20 56	2963	59 49 57	2980
	α Pegasi	E.	68 42 26	2935	67 10 51	2961	65 39 49	2987	64 9 20	3014
	Sun	E.	90 21 23	2858	88 48 10	2874	87 15 18	2890	85 42 46	2906
4	Jupiter	W.	50 58 5	2628	52 36 22	2640	54 14 22	2654	55 52 4	2666
	Antares	W.	49 7 14	2719	50 43 28	2729	52 19 30	2738	53 55 19	2748
	Fomalhaut	E.	40 51 20	3261	39 26 23	3320	38 2 35	3385	36 40 1	3456
	Venus	E.	52 20 6	3060	50 51 7	3075	49 22 27	3089	47 54 4	3104
	α Pegasi	E.	56 45 52	3170	55 19 7	3205	53 53 4	3242	52 27 45	3282
	Sun	E.	78 5 10	2984	76 34 37	2999	75 4 23	3014	73 34 28	3028
5	Jupiter	W.	63 56 29	2726	65 32 35	2738	67 8 25	2749	68 44 0	2760
	Antares	W.	61 51 8	2798	63 25 38	2808	64 59 55	2818	66 33 59	2828
	Venus	E.	40 36 36	3176	39 9 58	3189	37 43 36	3203	36 17 30	3216
	α Pegasi	E.	45 33 35	3520	44 13 33	3579	42 54 36	3643	41 36 48	3711
	Sun	E.	66 9 14	3097	64 41 1	3111	63 13 5	3124	61 45 25	3137
6	Jupiter	W.	76 38 28	2811	78 12 42	2821	79 46 43	2830	81 20 32	2839
	Antares	W.	74 21 15	2876	75 54 5	2884	77 26 44	2893	78 59 12	2902
	Venus	E.	29 10 50	3280	27 46 15	3292	26 21 54	3304	24 57 47	3317
	Sun	E.	54 30 51	3198	53 4 40	3209	51 38 42	3221	50 12 58	3232
7	Jupiter	W.	89 6 46	2882	90 39 28	2890	92 12 0	2897	93 44 23	2904
	Antares	W.	86 38 46	2943	88 10 10	2952	89 41 23	2960	91 12 26	2967
	α Aquilæ	W.	45 58 8	4128	47 7 43	4074	48 18 10	4027	49 29 23	3983
	Sun	E.	43 7 34	3288	41 43 8	3298	40 18 54	3308	38 54 52	3319
8	Antares	W.	98 45 23	3004	100 15 31	3010	101 45 31	3017	103 15 23	3024
	α Aquilæ	W.	55 34 54	3824	56 49 31	3800	58 4 33	3779	59 19 57	3761
	Sun	E.	31 57 51	3374	30 35 5	3386	29 12 33	3400	27 50 16	3413

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^{h}.	P. L. of Diff.	XVIII^{h}.	P. L. of Diff.	XXI^{h}.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
1	Spica	W.	61 7 4	2367	62 51 26	2381	64 35 28	2396	66 19 9	2410
	Mars	W.	57 56 58	2229	59 44 43	2243	61 32 6	2258	63 19 7	2273
	α Aquilæ	E.	43 31 11	3802	42 16 11	3923	41 3 15	4056	39 52 31	4203
	Fomalhaut	E.	71 56 48	2596	70 17 48	2618	68 39 18	2640	67 1 18	2664
	Venus	E.	83 12 50	2724	81 36 42	2741	80 0 56	2758	78 25 33	2775
	α Pegasi	E.	87 38 32	2684	86 1 31	2701	84 24 53	2719	82 48 39	2738
	Sun	E.	109 28 22	2657	107 50 45	2674	106 13 30	2691	104 36 38	2707
2	Spica	W.	74 52 17	2485	76 33 51	2500	78 15 4	2515	79 55 56	2530
	Mars	W.	72 8 44	2347	73 53 35	2362	75 38 4	2377	77 22 11	2392
	Jupiter	W.	30 54 45	2467	32 36 44	2481	34 18 24	2494	35 59 46	2507
	Antares	W.	29 40 33	2663	31 18 2	2659	32 55 37	2657	34 33 14	2658
	Fomalhaut	E.	58 59 26	2792	57 24 48	2821	55 50 47	2851	54 17 25	2882
	Venus	E.	70 34 17	2862	69 1 9	2879	67 28 23	2896	65 55 59	2913
	α Pegasi	E.	74 53 51	2841	73 20 16	2863	71 47 10	2886	70 14 33	2909
	Sun	E.	96 37 50	2792	95 3 11	2808	93 28 53	2825	91 54 57	2842
3	Spica	W.	88 15 8	2604	89 53 57	2618	91 32 27	2632	93 10 38	2646
	Mars	W.	85 57 39	2463	87 39 45	2477	89 21 31	2490	91 2 58	2504
	Jupiter	W.	44 21 55	2574	46 1 25	2588	47 40 37	2601	49 19 30	2615
	Antares	W.	42 40 18	2685	44 17 18	2692	45 54 8	2701	47 30 47	2710
	Fomalhaut	E.	46 41 14	3065	45 12 22	3110	43 44 24	3156	42 17 22	3206
	Venus	E.	58 19 19	2996	56 49 1	3012	55 19 3	3028	53 49 25	3043
	α Pegasi	E.	62 39 25	3043	61 10 6	3073	59 41 23	3104	58 13 18	3136
	Sun	E.	84 10 35	2922	82 38 44	2938	81 7 13	2954	79 36 2	2969
4	Jupiter	W.	57 29 30	2678	59 6 39	2691	60 43 31	2702	62 20 8	2714
	Antares	W.	55 30 55	2758	57 6 18	2768	58 41 28	2778	60 16 25	2788
	Fomalhaut	E.	35 18 48	3535	33 59 3	3623	32 40 54	3722	31 24 30	3832
	Venus	E.	46 25 59	3119	44 58 12	3133	43 30 43	3148	42 3 31	3162
	α Pegasi	E.	51 3 13	3324	49 39 29	3368	48 16 36	3415	46 54 37	3466
	Sun	E.	72 4 50	3043	70 35 30	3057	69 6 28	3071	67 37 43	3084
5	Jupiter	W.	70 19 21	2770	71 54 28	2781	73 29 21	2791	75 4 1	2801
	Antares	W.	68 7 51	2837	69 41 31	2847	71 14 58	2856	72 48 13	2866
	Venus	E.	34 51 40	3229	33 26 5	3242	32 0 45	3254	30 35 40	3267
	α Pegasi	E.	40 20 13	3787	39 4 57	3869	37 51 6	3959	36 38 46	4060
	Sun	E.	60 18 0	3149	58 50 50	3163	57 23 56	3174	55 57 16	3187
6	Jupiter	W.	82 54 9	2848	84 27 35	2857	86 0 49	2865	87 33 53	2873
	Antares	W.	80 31 28	2911	82 3 33	2919	83 35 28	2927	85 7 12	2935
	Venus	E.	23 33 55	3329	22 10 17	3342	20 46 54	3355	19 23 46	3370
	Sun	E.	48 47 27	3243	47 22 9	3255	45 57 5	3265	44 32 13	3276
7	Jupiter	W.	95 16 37	2912	96 48 41	2919	98 20 36	2926	99 52 22	2933
	Antares	W.	92 43 20	2974	94 14 5	2982	95 44 40	2989	97 15 6	2997
	α Aquilæ	W.	50 41 19	3944	51 53 54	3911	53 7 3	3879	54 20 44	3851
	Sun	E.	37 31 3	3330	36 7 26	3341	34 44 2	3351	33 20 50	3363
8	Antares	W.	104 45 6	3030	106 14 41	3037	107 44 8	3043	109 13 27	3050
	α Aquilæ	W.	60 35 40	3744	61 51 41	3727	63 7 59	3712	64 24 33	3700
	Sun	E.	26 28 14	3427	25 6 28	3442	23 44 59	3458	22 23 48	3478

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	III^{h}.	P. L. of Diff.	VI^{h}.	P. L. of Diff.	IX^{h}.	P. L. of Diff.
12	Sun W.	13° 11′ 23″	3743	14° 27′ 25″	3693	15° 44′ 19″	3657	17° 1′ 52″	3629
	Pollux E.	77 11 25	3118	75 43 37	3119	74 15 51	3121	72 48 7	3123
	Saturn E.	84 34 59	3082	83 6 27	3084	81 37 58	3086	80 9 31	3087
13	Sun W.	23 35 31	3549	24 55 1	3540	26 14 41	3531	27 34 31	3523
	Pollux E.	65 29 51	3129	64 2 16	3129	62 34 42	3129	61 7 8	3130
	Saturn E.	72 47 25	3087	71 19 0	3087	69 50 35	3087	68 22 9	3086
	Regulus E.	101 11 21	3078	99 42 45	3078	98 14 9	3078	96 45 33	3078
14	Sun W.	34 15 38	3491	35 36 12	3486	36 56 52	3480	38 17 38	3474
	Pollux E.	53 49 28	3132	52 21 57	3133	50 54 27	3132	49 26 56	3133
	Saturn E.	60 59 37	3078	59 31 1	3076	58 2 22	3073	56 33 39	3069
	Regulus E.	89 22 7	3069	87 53 19	3066	86 24 28	3063	84 55 33	3060
15	Sun W.	45 3 10	3443	46 24 38	3437	47 46 13	3431	49 7 55	3423
	Pollux E.	42 9 27	3134	40 41 59	3135	39 14 32	3137	37 47 7	3139
	Saturn E.	49 9 3	3051	47 39 53	3046	46 10 37	3041	44 41 15	3036
	Regulus E.	77 29 58	3041	76 0 36	3036	74 31 8	3030	73 1 33	3025
16	Sun W.	55 58 36	3383	57 21 12	3374	58 43 58	3365	60 6 55	3354
	Saturn E.	37 12 38	3004	35 42 30	2997	34 12 13	2989	32 41 46	2981
	Regulus E.	65 31 49	2993	64 1 27	2985	62 30 55	2977	61 0 14	2969
17	Sun W.	67 4 39	3300	68 28 50	3289	69 53 14	3276	71 17 53	3264
	Aldebaran W.	26 48 50	2924	28 20 38	2913	29 52 40	2901	31 24 57	2891
	Regulus E.	53 24 1	2922	51 52 10	2911	50 20 5	2901	48 47 47	2889
18	Sun W.	78 25 0	3195	79 51 15	3180	81 17 48	3165	82 44 39	3149
	Aldebaran W.	39 10 13	2827	40 44 6	2813	42 18 17	2798	43 52 47	2784
	Regulus E.	41 2 30	2828	39 28 38	2815	37 54 29	2801	36 20 2	2786
	Mars E.	91 48 46	2702	90 12 9	2689	88 35 15	2676	86 58 3	2663
	Spica E.	94 56 32	2856	93 23 17	2843	91 49 45	2829	90 15 55	2815
19	Sun W.	90 3 45	3066	91 32 36	3049	93 1 48	3031	94 31 22	3014
	Aldebaran W.	51 50 6	2707	53 26 36	2692	55 3 27	2675	56 40 40	2658
	Mars E.	78 47 19	2590	77 8 10	2574	75 28 40	2558	73 48 48	2543
	Spica E.	82 21 55	2739	80 46 7	2723	79 9 58	2707	77 33 28	2691
20	Sun W.	102 4 55	2920	103 36 49	2901	105 9 7	2881	106 41 50	2862
	Aldebaran W.	64 52 34	2571	66 32 9	2553	68 12 9	2535	69 52 34	2517
	Pollux W.	22 1 9	2859	23 34 21	2805	25 8 43	2756	26 44 8	2714
	Mars E.	65 23 51	2460	63 41 42	2442	61 59 8	2426	60 16 10	2408
	Spica E.	69 25 22	2607	67 46 36	2590	66 7 27	2572	64 27 54	2556
21	Sun W.	114 31 44	2763	116 7 0	2744	117 42 42	2725	119 18 49	2705
	Aldebaran W.	78 21 5	2424	80 4 6	2405	81 47 34	2386	83 31 29	2367
	Pollux W.	34 54 2	2545	36 34 13	2517	38 15 3	2489	39 56 31	2463
	Saturn W.	26 21 0	2438	28 3 41	2419	29 46 49	2401	31 30 23	2382
	Mars E.	51 35 5	2321	49 49 36	2304	48 3 42	2286	46 17 22	2269
	Spica E.	56 4 13	2470	54 22 18	2453	52 39 59	2437	50 57 17	2421
	Jupiter E.	98 36 32	2403	96 53 1	2384	95 9 3	2365	93 24 38	2346
	Antares E.	101 58 13	2476	100 16 26	2456	98 34 11	2437	96 51 29	2418

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^h.	P. L. of Diff.	XVIII^h.	P. L. of Diff.	XXI^h.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
12	Sun	W.	18 19 55	3607	19 38 22	3588	20 57 9	3573	22 16 13	3560
	Pollux	E.	71 20 25	3124	69 52 44	3125	68 25 5	3126	66 57 27	3128
	Saturn	E.	78 41 5	3087	77 12 39	3087	75 44 14	3087	74 15 49	3088
13	Sun	W.	28 54 30	3516	30 14 36	3509	31 34 50	3503	32 55 11	3497
	Pollux	E.	59 39 35	3131	58 12 3	3131	56 44 31	3131	55 16 59	3132
	Saturn	E.	66 53 42	3084	65 25 13	3083	63 56 43	3082	62 28 11	3080
	Regulus	E.	95 16 56	3076	93 48 17	3074	92 19 36	3073	90 50 53	3070
14	Sun	W.	39 38 31	3468	40 59 31	3463	42 20 37.	3456	43 41 50	3450
	Pollux	E.	47 59 26	3133	46 31 56	3133	45 4 26	3133	43 36 56	3133
	Saturn	E.	55 4 52	3066	53 36 1	3063	52 7 6	3060	50 38 7	3056
	Regulus	E.	83 26 35	3056	81 57 32	3053	80 28 25	3050	78 59 14	3046
15	Sun	W.	50 29 45	3415	51 51 44	3408	53 13 52	3400	54 36 9	3391
	Pollux	E.	36 19 45	3142	34 52 26	3145	33 25 11	3148	31 58 0	3154
	Saturn	E.	43 11 47	3030	41 42 12	3024	40 12 29	3018	38 42 38	3010
	Regulus	E.	71 31 51	3019	70 2 2	3014	68 32 6	3007	67 2 2	3000
16	Sun	W.	61 30 4	3345	62 53 24	3334	64 16 56	3323	65 40 41	3312
	Saturn	E.	31 11 9	2972	29 40 21	2963	28 9 22	2954	26 38 12	2945
	Regulus	E.	59 29 22	2960	57 58 19	2951	56 27 5	2942	54 55 39	2932
17	Sun	W.	72 42 47	3251	74 7 56	3237	75 33 21	3224	76 59 2	3209
	Aldebaran	W.	32 57 28	2878	34 30 15	2866	36 3 18	2853	37 36 37	2840
	Regulus	E.	47 15 14	2878	45 42 27	2866	44 9 24	2853	42 36 5	2841
18	Sun	W.	84 11 49	3133	85 39 18	3117	87 7 7	3101	88 35 16	3084
	Aldebaran	W.	45 27 36	2769	47 2 44	2755	48 38 11	2740	50 13 58	2724
	Regulus	E.	34 45 16	2772	33 10 12	2758	31 34 49	2744	29 59 7	2729
	Mars	E.	85 20 33	2649	83 42 44	2635	82 4 36	2620	80 26 8	2604
	Spica	E.	88 41 46	2799	87 7 17	2785	85 32 29	2770	83 57 22	2755
19	Sun	W.	96 1 18	2995	97 31 37	2977	99 2 19	2958	100 33 25	2939
	Aldebaran	W.	58 18 16	2641	59 56 15	2624	61 34 37	2607	63 13 23	2588
	Mars	E.	72 8 34	2527	70 27 58	2510	68 46 59	2494	67 5 37	2477
	Spica	E.	75 56 36	2675	74 19 22	2657	72 41 45	2640	71 3 45	2624
20	Sun	W.	108 14 58	2842	109 48 31	2822	111 22 30	2803	112 56 54	2783
	Aldebaran	W.	71 33 24	2498	73 14 40	2480	74 56 22	2461	76 38 30	2442
	Pollux	W.	28 20 29	2675	29 57 42	2639	31 35 44	2605	33 14 32	2574
	Mars	E.	58 32 47	2391	56 48 59	2373	55 4 46	2356	53 20 8	2339
	Spica	E.	62 47 58	2538	61 7 37	2521	59 26 53	2504	57 45 45	2487
21	Sun	W.	120 55 22	2686	122 32 21	2667	124 9 45	2649	125 47 34	2629
	Aldebaran	W.	85 15 51	2348	87 0 40	2331	88 45 55	2312	90 31 37	2294
	Pollux	W.	41 38 36	2438	43 21 16	2415	45 4 30	2391	46 48 18	2368
	Saturn	W.	33 14 24	2363	34 58 52	2344	36 43 47	2325	38 29 10	2307
	Mars	E.	44 30 37	2252	42 43 27	2235	40 55 52	2219	39 7 53	2202
	Spica	E.	49 14 12	2405	47 30 45	2390	45 46 56	2376	44 2 47	2362
	Jupiter	E.	91 39 46	2328	89 54 27	2309	88 8 41	2291	86 22 29	2273
	Antares	E.	95 8 20	2399	93 24 44	2381	91 40 42	2362	89 56 13	2344

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
22	Pollux	W.	48 32 38	2346	50 17 30	2324	52 2 54	2304	53 48 48	2284
	Saturn	W.	40 15 0	2289	42 1 16	2271	43 47 58	2253	45 35 6	2236
	Mars	E.	37 19 29	2186	35 30 41	2171	33 41 30	2156	31 51 56	2142
	Spica	E.	42 18 17	2348	40 33 28	2337	38 48 22	2325	37 2 59	2315
	Jupiter	E.	84 35 50	2255	82 48 44	2237	81 1 12	2220	79 13 14	2203
	Antares	E.	88 11 18	2326	86 25 57	2309	84 40 10	2291	82 53 57	2274
23	Pollux	W.	62 45 25	2192	64 34 5	2175	66 23 10	2159	68 12 39	2144
	Saturn	W.	54 37 6	2154	56 26 43	2139	58 16 42	2125	60 7 3	2111
	Regulus	W.	26 34 29	2147	28 24 16	2132	30 14 27	2117	32 5 0	2103
	Jupiter	E.	70 7 8	2122	68 16 43	2107	66 25 55	2093	64 34 45	2079
	Antares	E.	73 56 54	2196	72 8 21	2183	70 19 28	2170	68 30 15	2157
24	Pollux	W.	77 25 34	2077	79 17 8	2066	81 8 59	2056	83 1 6	2046
	Saturn	W.	69 23 59	2048	71 16 18	2038	73 8 53	2028	75 1 43	2019
	Regulus	W.	41 23 5	2038	43 15 40	2028	45 8 31	2017	47 1 38	2008
	Jupiter	E.	55 13 54	2019	53 20 50	2009	51 27 30	2000	49 33 55	1991
	Antares	E.	59 19 43	2105	57 28 52	2098	55 37 50	2091	53 46 37	2086
25	Saturn	W.	84 29 11	1984	86 23 11	1979	88 17 19	1975	90 11 33	1972
	Regulus	W.	56 30 31	1972	58 24 49	1967	60 19 15	1963	62 13 47	1960
	Jupiter	E.	40 3 6	1961	38 8 31	1958	36 13 51	1956	34 19 8	1955
	Antares	E.	44 29 7	2078	42 37 34	2081	40 46 6	2087	38 54 47	2095
26	Regulus	W.	71 47 18	1956	73 42 1	1958	75 36 42	1960	77 31 19	1964
	Mars	W.	23 58 19	1900	25 54 32	1898	27 50 49	1897	29 47 7	1898
	α Aquilæ	E.	78 59 36	2556	77 19 41	2567	75 40 1	2580	74 0 39	2596
27	Regulus	W.	87 2 38	1992	88 56 25	2000	90 49 59	2009	92 43 20	2018
	Mars	W.	39 27 44	1918	41 23 29	1926	43 19 3	1933	45 14 24	1941
	Spica	W.	33 42 46	2091	35 33 59	2090	37 25 14	2091	39 16 27	2094
	α Aquilæ	E.	65 50 11	2711	64 13 46	2742	62 38 2	2777	61 3 4	2815
	Fomalhaut	E.	98 8 42	2231	96 21 1	2237	94 33 29	2245	92 46 8	2253
28	Mars	W.	54 47 19	1995	56 41 1	2008	58 34 23	2021	60 27 24	2035
	Spica	W.	48 30 43	2128	50 20 59	2138	52 11 0	2149	54 0 44	2161
	α Aquilæ	E.	53 22 12	3068	51 53 23	3133	50 25 54	3205	48 59 51	3284
	Fomalhaut	E.	83 53 3	2313	82 7 22	2328	80 22 3	2344	78 37 7	2361
29	Mars	W.	69 46 51	2111	71 37 33	2128	73 27 49	2145	75 17 40	2162
	Spica	W.	63 4 36	2230	64 52 19	2245	66 39 39	2261	68 26 36	2277
	Jupiter	W.	21 3 22	2212	22 51 31	2221	24 39 27	2232	26 27 7	2244
	Fomalhaut	E.	69 59 8	2462	68 17 2	2486	66 35 29	2510	64 54 30	2536
	α Pegasi	E.	85 52 57	2555	84 13 0	2574	82 33 29	2594	80 54 26	2615
	Sun	E.	134 18 45	2524	132 38 5	2540	130 57 47	2556	129 17 52	2574
30	Spica	W.	77 15 14	2363	78 59 42	2380	80 43 45	2398	82 27 22	2416
	Jupiter	W.	35 20 30	2318	37 6 4	2334	38 51 14	2350	40 36 0	2368
	Antares	W.	31 55 15	2507	33 36 19	2510	35 17 19	2515	36 58 12	2522
	Fomalhaut	E.	56 38 58	2683	55 1 55	2716	53 25 36	2751	51 50 4	2788
	α Pegasi	E.	72 46 40	2734	71 10 45	2760	69 35 25	2788	68 0 42	2817
	Sun	E.	121 4 17	2663	119 26 48	2683	117 49 45	2701	116 13 7	2720

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^h.	P. L. of Diff.	XVIII^h.	P. L. of Diff.	XXI^h.	P. L. of Diff.
22	Pollux	W.	55° 35′ 11″	2264	57° 22′ 3″	2245	59° 9′ 23″	2227	60° 57′ 11″	2209
	Saturn	W.	47 22 40	2219	49 10 39	2202	50 59 4	2186	52 47 53	2170
	Mars	E.	30 2 1	2128	28 11 45	2115	26 21 9	2104	24 30 16	2094
	Spica	E.	35 17 22	2307	33 31 32	2300	31 45 32	2296	29 59 27	2295
	Jupiter	E.	77 24 51	2186	75 36 2	2169	73 46 48	2153	71 57 10	2137
	Antares	E.	81 7 20	2258	79 20 18	2242	77 32 53	2227	75 45 5	2211
23	Pollux	W.	70 2 31	2129	71 52 46	2115	73 43 22	2102	75 34 18	2089
	Saturn	W.	61 57 46	2097	63 48 50	2084	65 40 14	2072	67 31 57	2059
	Regulus	W.	33 55 55	2088	35 47 12	2075	37 38 50	2062	39 30 48	2050
	Jupiter	E.	62 43 14	2066	60 51 22	2053	58 59 11	2041	57 6 41	2030
	Antares	E.	66 40 42	2145	64 50 51	2134	63 0 44	2124	61 10 21	2114
24	Pollux	W.	84 53 28	2037	86 46 4	2030	88 38 52	2023	90 31 51	2016
	Saturn	W.	76 54 48	2010	78 48 6	2002	80 41 37	1995	82 35 19	1989
	Regulus	W.	48 55 0	2000	50 48 35	1991	52 42 23	1984	54 36 22	1978
	Jupiter	E.	47 40 7	1984	45 46 7	1977	43 51 56	1970	41 57 35	1965
	Antares	E.	51 55 16	2082	50 3 49	2079	48 12 17	2077	46 20 42	2077
25	Saturn	W.	92 5 51	1970	94 0 13	1968	95 54 38	1967	97 49 4	1968
	Regulus	W.	64 8 24	1958	66 3 5	1956	67 57 49	1955	69 52 34	1956
	Jupiter	E.	32 24 23	1955	30 29 38	1957	28 34 56	1960	26 40 19	1966
	Antares	E.	37 3 40	2105	35 12 49	2118	33 22 18	2135	31 32 12	2155
26	Regulus	W.	79 25 50	1968	81 20 15	1973	83 14 32	1979	85 8 40	1985
	Mars	W.	31 43 24	1899	33 39 38	1902	35 35 47	1906	37 31 50	1912
	α Aquilæ	E.	72 21 38	2613	70 43 1	2634	69 4 52	2657	67 27 14	2683
27	Regulus	W.	94 36 26	2028	96 29 16	2039	98 21 50	2050	100 14 7	2061
	Mars	W.	47 9 31	1951	49 4 23	1961	50 58 59	1972	52 53 18	1983
	Spica	W.	41 7 36	2098	42 58 38	2104	44 49 31	2111	46 40 13	2119
	α Aquilæ	E.	59 28 56	2857	57 55 42	2903	56 23 27	2953	54 52 15	3008
	Fomalhaut	E.	90 58 59	2262	89 12 4	2273	87 25 25	2285	85 39 4	2299
28	Mars	W.	62 20 3	2050	64 12 19	2064	66 4 13	2079	67 55 44	2095
	Spica	W.	55 50 10	2174	57 39 17	2187	59 28 4	2200	61 16 31	2215
	α Aquilæ	E.	47 35 21	3371	46 12 31	3465	44 51 28	3570	43 32 21	3685
	Fomalhaut	E.	76 52 36	2379	75 8 31	2398	73 24 54	2419	71 41 46	2440
29	Mars	W.	77 7 5	2179	78 56 4	2196	80 44 37	2214	82 32 43	2233
	Spica	W.	70 13 9	2294	71 59 17	2311	73 45 1	2328	75 30 20	2345
	Jupiter	W.	28 14 29	2257	30 1 31	2271	31 48 13	2286	33 34 33	2302
	Fomalhaut	E.	63 14 7	2563	61 34 21	2591	59 55 13	2620	58 16 45	2650
	α Pegasi	E.	79 15 51	2636	77 37 45	2660	76 0 11	2684	74 23 9	2708
	Sun	E.	127 38 21	2591	125 59 13	2609	124 20 30	2626	122 42 11	2645
30	Spica	W.	84 10 34	2435	85 53 19	2453	87 35 38	2471	89 17 32	2489
	Jupiter	W.	42 20 21	2384	44 4 18	2402	45 47 50	2419	47 30 58	2436
	Antares	W.	38 38 55	2530	40 19 27	2539	41 59 46	2550	43 39 50	2562
	Fomalhaut	E.	50 15 21	2828	48 41 29	2869	47 8 31	2913	45 36 29	2959
	α Pegasi	E.	66 26 36	2847	64 53 9	2879	63 20 23	2911	61 48 18	2944
	Sun	E.	114 36 54	2740	113 1 7	2759	111 25 45	2778	109 50 48	2798

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.	Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Subtracted from Apparent Time.	Diff. for 1 Hour.
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Tues.	1	2 36 16.77	9.555	N.15 17 32.4	+44.91	15 54.06	66.11	3 5.19	0.300
Wed.	2	2 40 6.38	9.579	15 35 22.7	44.28	15 53.83	66.19	3 12.11	0.276
Thur.	3	2 43 56.55	9.602	15 52 57.6	43.63	15 53.60	66.27	3 18.47	0.253
Frid.	4	2 47 47.29	9.626	16 10 16.8	+42.97	15 53.37	66.35	3 24.26	0.229
Sat.	5	2 51 38.62	9.650	16 27 20.1	42.30	15 53.14	66.43	3 29.48	0.205
SUN.	6	2 55 30.53	9.675	16 44 7.0	41.61	15 52.91	66.51	3 34.12	0.180
Mon.	7	2 59 23.02	9.699	17 0 37.4	+40.91	15 52.68	66.59	3 38.17	0.156
Tues.	8	3 3 16.10	9.724	17 16 50.9	40.20	15 52.46	66.68	3 41.63	0.131
Wed.	9	3 7 9.77	9.749	17 32 47.2	39.48	15 52.24	66.76	3 44.51	0.107
Thur.	10	3 11 4.01	9.773	17 48 25.9	+38.74	15 52.03	66.84	3 46.81	0.083
Frid.	11	3 14 58.83	9.797	18 3 46.8	37.99	15 51.82	66.92	3 48.54	0.059
Sat.	12	3 18 54.23	9.820	18 18 49.6	37.23	15 51.61	67.01	3 49.70	0.036
SUN.	13	3 22 50.20	9.844	18 33 34.0	+36.46	15 51.41	67.09	3 50.29	0.012
Mon.	14	3 26 46.73	9.867	18 47 59.6	35.67	15 51.22	67.17	3 50.32	0.011
Tues.	15	3 30 43.81	9.890	19 2 6.1	34.87	15 51.03	67.25	3 49.79	0.034
Wed.	16	3 34 41.44	9.913	19 15 53.3	+34.06	15 50.84	67.34	3 48.72	0.057
Thur.	17	3 38 39.62	9.936	19 29 20.8	33.23	15 50.66	67.42	3 47.10	0.080
Frid.	18	3 42 38.35	9.958	19 42 28.5	32.40	15 50.48	67.50	3 44.93	0.102
Sat.	19	3 46 37.62	9.980	19 55 16.1	+31.56	15 50.30	67.58	3 42.23	0.124
SUN.	20	3 50 37.41	10.002	20 7 43.2	30.70	15 50.12	67.65	3 39.01	0.146
Mon.	21	3 54 37.72	10.024	20 19 49.7	29.83	15 49.95	67.73	3 35.26	0.168
Tues.	22	3 58 38.55	10.046	20 31 35.3	+28.95	15 49.78	67.80	3 31.00	0.189
Wed.	23	4 2 39.89	10.067	20 42 59.7	28.06	15 49.61	67.88	3 26.23	0.210
Thur.	24	4 6 41.74	10.088	20 54 2.8	27.17	15 49.45	67.95	3 20.95	0.231
Frid.	25	4 10 44.08	10.109	21 4 44.2	+26.27	15 49.29	68.02	3 15.17	0.252
Sat.	26	4 14 46.92	10.129	21 15 3.9	25.36	15 49.13	68.09	3 8.91	0.272
SUN.	27	4 18 50.24	10.149	21 25 1.7	24.44	15 48.97	68.15	3 2.17	0.292
Mon.	28	4 22 54.03	10.168	21 34 37.2	+23.51	15 48.82	68.22	2 54.95	0.311
Tues.	29	4 26 58.29	10.187	21 43 50.4	22.57	15 48.67	68.28	2 47.27	0.330
Wed.	30	4 31 3.00	10.205	21 52 41.1	21.63	15 48.52	68.34	2 39.14	0.348
Thur.	31	4 35 8.15	10.223	22 1 9.0	20.68	15 48.38	68.40	2 30.57	0.366
Frid.	32	4 39 13.73	10.241	N.22 9 14.0	+19.72	15 48.24	68.45	2 21.58	0.384

NOTE.—The mean time of semidiameter passing may be found by subtracting 0s.18 from the sidereal time.
The sign + prefixed to the hourly change of declination indicates that north declinations are increasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	Diff. for 1 Hour.	THE SUN'S Apparent Declination.	Diff. for 1 Hour.	Equation of Time, to be Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	m s	s	h m s
Tues.	1	2 36 17.26	9.556	N. 15 17 34.6	+44.91	3 5.20	0.300	2 39 22.46
Wed.	2	2 40 6.89	9.580	15 35 24.9	44.28	3 12.13	0.276	2 43 19.02
Thur.	3	2 43 57.08	9.603	15 52 59.9	43.63	3 18.49	0.253	2 47 15.57
Frid.	4	2 47 47.85	9.627	16 10 19.2	+42.97	3 24.28	0.229	2 51 12.13
Sat.	5	2 51 39.19	9.651	16 27 22.5	42.30	3 29.49	0.205	2 55 8.68
SUN.	6	2 55 31.11	9.676	16 44 9.5	41.61	3 34.13	0.180	2 59 5.24
Mon.	7	2 59 23.61	9.700	17 0 39.9	+40.91	3 38.18	0.156	3 3 1.79
Tues.	8	3 3 16.70	9.725	17 16 53.4	40.20	3 41.64	0.131	3 6 58.35
Wed.	9	3 7 10.38	9.749	17 32 49.7	39.48	3 44.52	0.107	3 10 54.90
Thur.	10	3 11 4.63	9.773	17 48 28.4	+38.74	3 46.84	0.083	3 14 51.46
Frid.	11	3 14 59.46	9.797	18 3 49.3	37.99	3 48.55	0.059	3 18 48.01
Sat.	12	3 18 54.86	9.820	18 18 52.1	37.23	3 49.71	0.036	3 22 44.57
SUN.	13	3 22 50.83	9.844	18 33 36.4	+36.46	3 50.30	0.012	3 26 41.12
Mon.	14	3 26 47.36	9.867	18 48 1.9	35.67	3 50.32	0.011	3 30 37.68
Tues.	15	3 30 44.44	9.890	19 2 8.4	34.87	3 49.79	0.034	3 34 34.23
Wed.	16	3 34 42.07	9.913	19 15 55.5	+34.06	3 48.72	0.057	3 38 30.80
Thur.	17	3 38 40.25	9.936	19 29 23.0	33.23	3 47.10	0.080	3 42 27.35
Frid.	18	3 42 38.98	9.958	19 42 30.6	32.40	3 44.93	0.102	3 46 23 91
Sat.	19	3 46 38.24	9.980	19 55 18.1	+31.56	3 42.22	0.124	3 50 20.46
SUN.	20	3 50 38.02	10.002	20 7 45.1	30.70	3 39.00	0.146	3 54 17.02
Mon.	21	3 54 38.32	10.024	20 19 51.5	29.83	3 35.25	0.168	3 58 13.57
Tues.	22	3 58 39.14	10.045	20 31 37.0	+28.95	3 30.99	0.189	4 2 10.13
Wed.	23	4 2 40.47	10.066	20 43 1.3	28.06	3 26.22	0.210	4 6 6.68
Thur.	24	4 6 42.30	10.087	20 54 4.3	27.17	3 20.94	0.231	4 10 3.24
Frid.	25	4 10 44.63	10.108	21 4 45.7	+26.27	3 15.16	0.252	4 13 59.79
Sat.	26	4 14 47.45	10.128	21 15 5.3	25.36	3 8.90	0.272	4 17 56.36
SUN.	27	4 18 50.75	10.148	21 25 3.0	24.44	3 2.16	0.292	4 21 52.91
Mon.	28	4 22 54.52	10.167	21 34 38.4	+23.51	2 54.94	0.311	4 25 49.47
Tues.	29	4 26 58.76	10.186	21 43 51.5	22.57	2 47.26	0.330	4 29 46.02
Wed.	30	4 31 3.45	10.204	21 52 42.1	21.63	2 39.13	0.348	4 33 42.58
Thur.	31	4 35 8 58	10.222	22 1 9.9	20.68	2 30.56	0.366	4 37 39.13
Frid.	32	4 39 14.13	10.240	N 22 9 14.8	+19.72	2 21.57	0.384	4 41 35.69

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign + prefixed to the hourly change of declination indicates that north declinations are increasing.

Diff. for 1 hour, +9ˢ.8565. (Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S TRUE LONGITUDE. λ	THE SUN'S TRUE LONGITUDE. λ'	Diff. for 1 Hour.	THE SUN'S LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
								h m s
1	122	41° 30′ 48.″7	30′ 47.″7	145.″38	— 0.″02	0.0035916	+45.7	21 17 7.73
2	123	42 28 57.0	28 55.9	145.32	0.15	0.0037008	45.3	21 13 11.82
3	124	43 27 3.9	27 2.7	145.26	0.28	0.0038090	44.8	21 9 15.92
4	125	44 25 9.3	25 8.0	145.20	— 0.42	0.0039161	+44.3	21 5 20.01
5	126	45 23 13.4	23 11.9	145.14	0.54	0.0040219	43.7	21 1 24.10
6	127	46 21 16.1	21 14.5	145.08	0.64	0.0041262	43.1	20 57 28.19
7	128	47 19 17.4	19 15.7	145.02	— 0.72	0.0042289	+42.4	20 53 32.28
8	129	48 17 17.2	17 15.4	144.96	0.79	0.0043299	41.7	20 49 36.37
9	130	49 15 15.7	15 13.7	144.90	0.81	0.0044290	40.9	20 45 40.46
10	131	50 13 12.7	13 10.5	144.84	— 0.80	0.0045262	+40.1	20 41 44.55
11	132	51 11 8.1	11 5.8	144.78	0.76	0.0046216	39.3	20 37 48.64
12	133	52 9 2.0	8 59.6	144.71	0.71	0.0047151	38.5	20 33 52.73
13	134	53 6 54.3	6 51.8	144.65	— 0.62	0.0048065	+37.7	20 29 56.82
14	135	54 4 45.0	4 42.3	144.58	0.51	0.0048960	36.9	20 26 0.91
15	136	55 2 34.0	2 31.2	144.51	0.38	0.0049836	36.1	20 22 5.00
16	137	56 0 21.4	0 18.4	144.44	— 0.25	0.0050694	+35.4	20 18 9.09
17	138	56 58 7.1	58 4.0	144.37	— 0.12	0.0051534	34.7	20 14 13.18
18	139	57 55 51.2	55 48.0	144.30	+ 0.01	0.0052357	34.0	20 10 17.27
19	140	58 53 33.7	53 30.3	144.23	+ 0.12	0.0053165	+33.4	20 6 21.36
20	141	59 51 14.6	51 11.0	144.17	0.20	0.0053960	32.9	20 2 25.45
21	142	60 48 53.9	48 50.2	144.11	0.27	0.0054744	32.3	19 58 29.54
22	143	61 46 31.7	46 27.9	144.05	+ 0.31	0.0055514	+31.8	19 54 33.63
23	144	62 44 8.2	44 4.1	143.99	0.32	0.0056272	31.3	19 50 37.72
24	145	63 41 43.2	41 38.9	143.93	0.29	0.0057020	30.9	19 46 41.81
25	146	64 39 16.9	39 12.5	143.88	+ 0.23	0.0057757	+30.5	19 42 45.90
26	147	65 36 49.5	36 45.0	143.83	0.16	0.0058484	30.1	19 38 49.99
27	148	66 34 21.0	34 16.4	143.79	+ 0.06	0.0059200	29.6	19 34 54.08
28	149	67 31 51.6	31 46.8	143.75	— 0.06	0.0059904	+29.1	19 30 58.17
29	150	68 29 21.2	29 16.2	143.71	0.19	0.0060596	28.6	19 27 2.26
30	151	69 26 49.9	26 44.7	143.68	0.32	0.0061275	28.0	19 23 6.35
31	152	70 24 17.9	24 12.6	143.65	0.45	0.0061939	27.3	19 19 10.44
32	153	71 21 45.2	21 39.8	143.63	— 0.58	0.0062587	+26.6	19 15 14.53

NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ', to the mean equinox of January $0^d.0$.

Diff. for 1 Hour, — 9s.8296. (Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	15 52.0	15 44.3	58 7.0	−2.36	57 38.9	−2.31	17 39.1	2.23	20.1
2	15 36.9	15 29.8	57 11.7	2.22	56 45.7	2.10	18 31.1	2.09	21.1
3	15 23.2	15 17.0	56 21.3	1.96	55 58.6	1.81	19 19.7	1.96	22.1
4	15 11.3	15 6.2	55 37.8	−1.65	55 18.9	−1.49	20 5.4	1.85	23.1
5	15 1.6	14 57.6	55 2.1	1.32	54 47.3	1.15	20 48.9	1.78	24.1
6	14 54.1	14 51.2	54 34.5	0.98	54 23.7	0.82	21 31.1	1.74	25.1
7	14 48.7	14 46.8	54 14.8	−0.67	54 7.6	−0.53	22 12.7	1.73	26.1
8	14 45.3	14 44.2	54 2.1	0.39	53 58.2	0.26	22 54.5	1.75	27.1
9	14 43.6	14 43.4	53 55.9	−0.13	53 55.0	−0.01	23 37.1	1.80	28.1
10	14 43.5	14 44.0	53 55.6	+0.10	53 57.5	+0.21			29.1
11	14 44.9	14 46.1	54 0.7	0.32	54 5.2	0.43	0 21.1	1.87	0.4
12	14 47.7	14 49.7	54 11.1	0.54	54 18.3	0.65	1 6.7	1.94	1.4
13	14 52.0	14 54.7	54 26.8	+0.77	54 36.8	+0.90	1 54.2	2.02	2.4
14	14 57.9	15 1.4	54 48.3	1.02	55 1.2	1.14	2 43.3	2.08	3.4
15	15 5.3	15 9.7	55 15.6	1.27	55 31.7	1.41	3 33.7	2.12	4.4
16	15 14.5	15 19.7	55 49.4	+1.54	56 8.6	+1.66	4 24.7	2.13	5.4
17	15 25.4	15 31.4	56 29.3	1.79	56 51.5	1.90	5 15.9	2.13	6.4
18	15 37.8	15 44.5	57 15.0	2.00	57 39.5	2.08	6 6.9	2.12	7.4
19	15 51.4	15 58.4	58 4.8	+2.13	58 30.6	+2.15	6 57.7	2.12	8.4
20	16 5.4	16 12.3	58 56.4	2.13	59 21.6	2.06	7 48.6	2.13	9.4
21	16 18.9	16 25.0	59 45.8	1.95	60 8.3	1.78	8 40.2	2.18	10.4
22	16 30.5	16 35.2	60 28.5	+1.56	60 45.8	+1.29	9 33.2	2.25	11.4
23	16 38.9	16 41.5	60 59.4	0.97	61 8.9	+0.61	10 28.4	2.35	12.4
24	16 42.9	16 43.0	61 14.0	+0.23	61 14.3	−0.18	11 26.1	2.46	13.4
25	16 41.7	16 39.2	61 9.7	−0.58	61 0.4	−0.96	12 26.1	2.54	14.4
26	16 35.4	16 30.6	60 46.6	1.32	60 28.7	1.63	13 27.5	2.56	15.4
27	16 24.8	16 18.2	60 7.4	1.90	59 43.2	2.11	14 28.5	2.51	16.4
28	16 11.0	16 3.4	59 16.8	−2.26	58 48.9	−2.36	15 27.3	2.37	17.4
29	15 55.6	15 47.7	58 20.2	2.40	57 51.3	2.39	16 22.6	2.22	18.4
30	15 39.9	15 32.4	57 22.8	2.33	56 55.3	2.24	17 14.1	2.06	19.4
31	15 25.3	15 18.6	56 29.1	2.12	56 4.5	1.97	18 1.9	1.93	20.4
32	15 12.5	15 6.9	55 41.9	−1.80	55 21.4	−1.61	18 46.9	1.82	21.4

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	TUESDAY 1.			
	h m s	s	° ′ ″	″
0	19 39 36.59	2.4119	S. 20 29 35.7	2.788
1	19 42 1.16	2.4070	20 26 44.8	2.909
2	19 44 25.43	2.4021	20 23 46.6	3.029
3	19 46 49.41	2.3972	20 20 41.3	3.147
4	19 49 13.09	2.3922	20 17 28.9	3.265
5	19 51 36.47	2.3871	20 14 9.5	3.381
6	19 53 59.54	2.3820	20 10 43.2	3.497
7	19 56 22.31	2.3769	20 7 9.9	3.612
8	19 58 44.77	2.3717	20 3 29.7	3.726
9	20 1 6.92	2.3666	19 59 42.8	3.839
10	20 3 28.76	2.3614	19 55 49.1	3.951
11	20 5 50.29	2.3562	19 51 48.7	4.062
12	20 8 11.51	2.3510	19 47 41.7	4.172
13	20 10 32.41	2.3457	19 43 28.1	4.281
14	20 12 52.99	2.3404	19 39 8.0	4.388
15	20 15 13.26	2.3351	19 34 41.5	4.495
16	20 17 33.20	2.3297	19 30 8.6	4.602
17	20 19 52.82	2.3243	19 25 29.3	4.707
18	20 22 12.12	2.3190	19 20 43.8	4.810
19	20 24 31.10	2.3136	19 15 52.1	4.913
20	20 26 49.75	2.3082	19 10 54.2	5.016
21	20 29 8.08	2.3027	19 5 50.2	5.117
22	20 31 26.08	2.2972	19 0 40.2	5.217
23	20 33 43.75	2.2918	S. 18 55 24.2	5.315
	WEDNESDAY 2.			
0	20 36 1.10	2.2863	S. 18 50 2.4	5.413
1	20 38 18.12	2.2809	18 44 34.7	5.510
2	20 40 34.81	2.2755	18 39 1.2	5.606
3	20 42 51.18	2.2701	18 33 22.0	5.701
4	20 45 7.22	2.2646	18 27 37.1	5.795
5	20 47 22.93	2.2592	18 21 46.6	5.887
6	20 49 38.32	2.2537	18 15 50.6	5.979
7	20 51 53.38	2.2482	18 9 49.1	6.070
8	20 54 8.11	2.2427	18 3 42.2	6.160
9	20 56 22.51	2.2372	17 57 29.9	6.249
10	20 58 36.58	2.2318	17 51 12.3	6.337
11	21 0 50.33	2.2264	17 44 49.5	6.423
12	21 3 3.75	2.2210	17 38 21.6	6.508
13	21 5 16.85	2.2156	17 31 48.6	6.593
14	21 7 29.62	2.2102	17 25 10.5	6.678
15	21 9 42.07	2.2048	17 18 27.3	6.761
16	21 11 54.20	2.1995	17 11 39.2	6.842
17	21 14 6.01	2.1941	17 4 46.3	6.922
18	21 16 17.49	2.1887	16 57 48.6	7.001
19	21 18 28.65	2.1834	16 50 46.2	7.080
20	21 20 39.50	2.1782	16 43 39.0	7.158
21	21 22 50.03	2.1729	16 36 27.2	7.235
22	21 25 0.24	2.1676	16 29 10.8	7.311
23	21 27 10.14	2.1623	16 21 49.9	7.385
24	21 29 19.72	2.1571	S. 16 14 24.6	7.459

Hour.	Right Ascension	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	THURSDAY 3.			
	h m s	s	° ′ ″	″
0	21 29 19.72	2.1571	S. 16 14 24.6	7.459
1	21 31 28.99	2.1519	16 6 54.9	7.532
2	21 33 37.95	2.1468	15 59 20.8	7.604
3	21 35 46.60	2.1417	15 51 42.4	7.675
4	21 37 54.95	2.1366	15 43 59.8	7.744
5	21 40 2.99	2.1314	15 36 13.1	7.812
6	21 42 10.72	2.1263	15 28 22.3	7.880
7	21 44 18.15	2.1213	15 20 27.5	7.947
8	21 46 25.28	2.1163	15 12 28.6	8.014
9	21 48 32.11	2.1114	15 4 25.8	8.079
10	21 50 38.65	2.1065	14 56 19.1	8.143
11	21 52 44.89	2.1016	14 48 8.6	8.207
12	21 54 50.84	2.0967	14 39 54.3	8.269
13	21 56 56.50	2.0919	14 31 36.3	8.331
14	21 59 1.87	2.0872	14 23 14.6	8.391
15	22 1 6.96	2.0824	14 14 49.4	8.450
16	22 3 11.76	2.0777	14 6 20.6	8.509
17	22 5 16.28	2.0730	13 57 48.3	8.567
18	22 7 20.52	2.0683	13 49 12.6	8.624
19	22 9 24.48	2.0637	13 40 33.5	8.680
20	22 11 28.17	2.0592	13 31 51.0	8.736
21	22 13 31.59	2.0547	13 23 5.2	8.790
22	22 15 34.74	2.0502	13 14 16.2	8.843
23	22 17 37.62	2.0457	S. 13 5 24.1	8.895
	FRIDAY 4.			
0	22 19 40.23	2.0413	S. 12 56 28.8	8.947
1	22 21 42.58	2.0370	12 47 30.4	8.998
2	22 23 44.67	2.0327	12 38 29.0	9.048
3	22 25 46.51	2.0285	12 29 24.7	9.097
4	22 27 48.09	2.0243	12 20 17.4	9.145
5	22 29 49.42	2.0202	12 11 7.3	9.192
6	22 31 50.51	2.0161	12 1 54.4	9.239
7	22 33 51.35	2.0119	11 52 38.7	9.285
8	22 35 51.94	2.0078	11 43 20.2	9.330
9	22 37 52.29	2.0038	11 33 59.1	9.374
10	22 39 52.40	1.9999	11 24 35.4	9.417
11	22 41 52.28	1.9961	11 15 9.1	9.460
12	22 43 51.93	1.9922	11 5 40.2	9.502
13	22 45 51.35	1.9884	10 56 8.9	9.542
14	22 47 50.54	1.9846	10 46 35.2	9.582
15	22 49 49.50	1.9809	10 36 59.1	9.622
16	22 51 48.25	1.9773	10 27 20.6	9.661
17	22 53 46.78	1.9737	10 17 39.8	9.698
18	22 55 45.09	1.9701	10 7 56.8	9.735
19	22 57 43.19	1.9666	9 58 11.6	9.771
20	22 59 41.08	1.9631	9 48 24.3	9.806
21	23 1 38.76	1.9597	9 38 34.9	9.841
22	23 3 36.24	1.9564	9 28 43.4	9.876
23	23 5 33.52	1.9531	9 18 49.8	9.909
24	23 7 30.61	1.9498	S. 9 8 54.3	9.941

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY 5.			
	h m s	s	° ′ ″	″
0	23 7 30.61	1.9498	S. 9 8 54.3	9.941
1	23 9 27.50	1.9466	8 58 56.9	9.972
2	23 11 24.20	1.9434	8 48 57.6	10.003
3	23 13 20.71	1.9403	8 38 56.5	10.033
4	23 15 17.04	1.9372	8 28 53.6	10.063
5	23 17 13.18	1.9342	8 18 49.0	10.092
6	23 19 9.14	1.9313	8 8 42.6	10.121
7	23 21 4.93	1.9284	7 58 34.5	10.147
8	23 23 0.55	1.9255	7 48 24.9	10.173
9	23 24 55.99	1.9227	7 38 13.7	10.199
10	23 26 51.27	1.9200	7 28 1.0	10.224
11	23 28 46.39	1.9173	7 17 46.8	10.249
12	23 30 41.35	1.9147	7 7 31.1	10.273
13	23 32 36.15	1.9121	6 57 14.0	10.296
14	23 34 30.80	1.9095	6 46 55.6	10.318
15	23 36 25.29	1.9069	6 36 35.9	10.339
16	23 38 19.63	1.9045	6 26 14.9	10.361
17	23 40 13.83	1.9022	6 15 52.6	10.382
18	23 42 7.89	1.8998	6 5 29.1	10.401
19	23 44 1.81	1.8975	5 55 4.5	10.419
20	23 45 55.59	1.8952	5 44 38.8	10.438
21	23 47 49.24	1.8931	5 34 12.0	10.456
22	23 49 42.76	1.8910	5 23 44.1	10.473
23	23 51 36.16	1.8890	S. 5 13 15.2	10.489
	SUNDAY 6.			
0	23 53 29.44	1.8870	S. 5 2 45.4	10.504
1	23 55 22.60	1.8850	4 52 14.7	10.519
2	23 57 15.64	1.8830	4 41 43.1	10.534
3	23 59 8.56	1.8811	4 31 10.6	10.547
4	0 1 1.37	1.8793	4 20 37.4	10.560
5	0 2 54.08	1.8776	4 10 3.4	10.572
6	0 4 46.68	1.8759	3 59 28.7	10.584
7	0 6 39.18	1.8742	3 48 53.3	10.595
8	0 8 31.58	1.8726	3 38 17.3	10.605
9	0 10 23.89	1.8710	3 27 40.7	10.615
10	0 12 16.10	1.8695	3 17 3.5	10.624
11	0 14 8.23	1.8681	3 6 25.8	10.632
12	0 16 0.27	1.8667	2 55 47.6	10.640
13	0 17 52.23	1.8653	2 45 9.0	10.647
14	0 19 44.11	1.8640	2 34 30.0	10.654
15	0 21 35.91	1.8627	2 23 50.5	10.661
16	0 23 27.63	1.8615	2 13 10.7	10.666
17	0 25 19.29	1.8604	2 2 30.6	10.670
18	0 27 10.88	1.8593	1 51 50.3	10.673
19	0 29 2.40	1.8582	1 41 9.8	10.677
20	0 30 53.86	1.8572	1 30 29.1	10.680
21	0 32 45.27	1.8563	1 19 48.2	10.682
22	0 34 36.62	1.8554	1 9 7.2	10.683
23	0 36 27.92	1.8545	0 58 26.2	10.684
24	0 38 19.16	1.8537	S. 0 47 45.1	10.685
	MONDAY 7.			
0	0 38 19.16	1.8537	S. 0 47 45.1	10.685
1	0 40 10.36	1.8530	0 37 4.0	10.684
2	0 42 1.52	1.8522	0 26 23.0	10.683
3	0 43 52.63	1.8515	0 15 42.0	10.682
4	0 45 43.70	1.8509	S. 0 5 1.2	10.679
5	0 47 34.74	1.8504	N. 0 5 39.5	10.676
6	0 49 25.75	1.8499	0 16 20.0	10.673
7	0 51 16.73	1.8495	0 27 0.3	10.669
8	0 53 7.69	1.8491	0 37 40.3	10.664
9	0 54 58.62	1.8487	0 48 20.0	10.659
10	0 56 49.53	1.8484	0 58 59.4	10.653
11	0 58 40.42	1.8481	1 9 38.4	10.647
12	1 0 31.30	1.8478	1 20 17.0	10.639
13	1 2 22.16	1.8477	1 30 55.1	10.631
14	1 4 13.02	1.8476	1 41 32.7	10.623
15	1 6 3.87	1.8475	1 52 9.9	10.615
16	1 7 54.72	1.8475	2 2 46.5	10.605
17	1 9 45.57	1.8475	2 13 22.5	10.594
18	1 11 36.42	1.8476	2 23 57.8	10.583
19	1 13 27.28	1.8477	2 34 32.5	10.571
20	1 15 18.15	1.8479	2 45 6.4	10.559
21	1 17 9.03	1.8481	2 55 39.6	10.547
22	1 18 59.92	1.8483	3 6 12.0	10.534
23	1 20 50.82	1.8485	N. 3 16 43.6	10.520
	TUESDAY 8.			
0	1 22 41.74	1.8489	N. 3 27 14.4	10.506
1	1 24 32.69	1.8493	3 37 44.3	10.490
2	1 26 23.66	1.8497	3 48 13.2	10.474
3	1 28 14.66	1.8502	3 58 41.2	10.458
4	1 30 5.69	1.8507	4 9 8.2	10.441
5	1 31 56.75	1.8512	4 19 34.1	10.423
6	1 33 47.84	1.8518	4 29 58.9	10.405
7	1 35 38.97	1.8525	4 40 22.7	10.387
8	1 37 30.14	1.8532	4 50 45.3	10.367
9	1 39 21.36	1.8540	5 1 6.7	10.347
10	1 41 12.62	1.8548	5 11 26.9	10.326
11	1 43 3.93	1.8556	5 21 45.8	10.304
12	1 44 55.29	1.8564	5 32 3.4	10.282
13	1 46 46.70	1.8573	5 42 19.7	10.260
14	1 48 38.17	1.8583	5 52 34.6	10.237
15	1 50 29.70	1.8593	6 2 48.1	10.213
16	1 52 21.29	1.8603	6 13 0.2	10.189
17	1 54 12.94	1.8614	6 23 10.8	10.163
18	1 56 4.66	1.8625	6 33 19.8	10.137
19	1 57 56.44	1.8636	6 43 27.3	10.111
20	1 59 48.29	1.8648	6 53 33.2	10.084
21	2 1 40.22	1.8661	7 3 37.4	10.057
22	2 3 32.23	1.8674	7 13 40.0	10.029
23	2 5 24.31	1.8687	7 23 40.9	10.000
24	2 7 16.47	1.8700	N. 7 33 40.0	9.970

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	WEDNESDAY 9.			
	h m s	s	° ′ ″	″
0	2 7 16.47	1.8700	N. 7 33 40.0	9.970
1	2 9 8.71	1.8714	7 43 37.3	9.940
2	2 11 1.04	1.8729	7 53 32.8	9.910
3	2 12 53.46	1.8743	8 3 26.5	9.878
4	2 14 45.96	1.8758	8 13 18.2	9.846
5	2 16 38.55	1.8773	8 23 8.0	9.813
6	2 18 31.24	1.8789	8 32 55.8	9.780
7	2 20 24.02	1.8805	8 42 41.6	9.746
8	2 22 16.90	1.8822	8 52 25.3	9.711
9	2 24 9.88	1.8839	9 2 6.9	9.676
10	2 26 2.96	1.8856	9 11 46.4	9.641
11	2 27 56.15	1.8873	9 21 23.8	9.605
12	2 29 49.44	1.8891	9 30 59.0	9.567
13	2 31 42.84	1.8909	9 40 31.9	9.529
14	2 33 36.35	1.8928	9 50 2.5	9.491
15	2 35 29.98	1.8947	9 59 30.8	9.452
16	2 37 23.72	1.8966	10 8 56.7	9.412
17	2 39 17.57	1.8985	10 18 20.2	9.372
18	2 41 11.54	1.9005	10 27 41.3	9.331
19	2 43 5.63	1.9025	10 36 59.9	9.289
20	2 44 59.84	1.9046	10 46 16.0	9.246
21	2 46 54.18	1.9067	10 55 29.5	9.203
22	2 48 48.64	1.9088	11 4 40.4	9.160
23	2 50 43.23	1.9109	N.11 13 48.7	9.117
	THURSDAY 10.			
0	2 52 37.95	1.9131	N.11 22 54.4	9.072
1	2 54 32.80	1.9153	11 31 57.4	9.026
2	2 56 27.78	1.9175	11 40 57.6	8.979
3	2 58 22.90	1.9197	11 49 54.9	8.932
4	3 0 18.15	1.9220	11 58 49.4	8.885
5	3 2 13.54	1.9243	12 7 41.1	8.837
6	3 4 9.07	1.9267	12 16 29.9	8.789
7	3 6 4.74	1.9290	12 25 15.8	8.740
8	3 8 0.55	1.9313	12 33 58.7	8.689
9	3 9 56.50	1.9337	12 42 38.5	8.637
10	3 11 52.60	1.9362	12 51 15.2	8.586
11	3 13 48.85	1.9387	12 59 48.8	8.534
12	3 15 45.24	1.9411	13 8 19.3	8.482
13	3 17 41.78	1.9436	13 16 46.6	8.429
14	3 19 38.47	1.9462	13 25 10.7	8.375
15	3 21 35.32	1.9487	13 33 31.6	8.320
16	3 23 32.32	1.9512	13 41 49.1	8.264
17	3 25 29.47	1.9538	13 50 3.3	8.208
18	3 27 26.78	1.9565	13 58 14.1	8.152
19	3 29 24.25	1.9591	14 6 21.5	8.094
20	3 31 21.87	1.9617	14 14 25.4	8.036
21	3 33 19.65	1.9644	14 22 25.8	7.977
22	3 35 17.59	1.9671	14 30 22.7	7.919
23	3 37 15.70	1.9698	14 38 16.1	7.860
24	3 39 13.97	1.9725	N.14 46 5.9	7.799

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	FRIDAY 11.			
	h m s	s	° ′ ″	″
0	3 39 13.97	1.9725	N.14 46 5.9	7.799
1	3 41 12.40	1.9752	14 53 52.0	7.737
2	3 43 11.00	1.9780	15 1 34.4	7.675
3	3 45 9.76	1.9807	15 9 13.0	7.612
4	3 47 8.68	1.9834	15 16 47.9	7.549
5	3 49 7.77	1.9862	15 24 18.9	7.485
6	3 51 7.03	1.9891	15 31 46.1	7.421
7	3 53 6.46	1.9919	15 39 9.4	7.356
8	3 55 6.06	1.9947	15 46 28.8	7.290
9	3 57 5.82	1.9974	15 53 44.2	7.224
10	3 59 5.75	2.0002	16 0 55.6	7.157
11	4 1 5.85	2.0031	16 8 3.0	7.089
12	4 3 6.13	2.0061	16 15 6.3	7.021
13	4 5 6.58	2.0089	16 22 5.5	6.952
14	4 7 7.20	2.0117	16 29 0.5	6.882
15	4 9 7.99	2.0146	16 35 51.3	6.812
16	4 11 8.95	2.0175	16 42 37.9	6.741
17	4 13 10.09	2.0204	16 49 20.2	6.669
18	4 15 11.40	2.0233	16 55 58.2	6.597
19	4 17 12.88	2.0262	17 2 31.9	6.525
20	4 19 14.54	2.0291	17 9 1.2	6.451
21	4 21 16.37	2.0319	17 15 26.0	6.376
22	4 23 18.37	2.0348	17 21 46.3	6.301
23	4 25 20.55	2.0377	N.17 28 2.1	6.226
	SATURDAY 12.			
0	4 27 22.90	2.0407	N.17 34 13.4	6.150
1	4 29 25.43	2.0436	17 40 20.1	6.074
2	4 31 28.13	2.0464	17 46 22.2	5.997
3	4 33 31.00	2.0493	17 52 19.7	5.919
4	4 35 34.04	2.0522	17 58 12.5	5.841
5	4 37 37.26	2.0551	18 4 0.6	5.762
6	4 39 40.65	2.0579	18 9 43.9	5.682
7	4 41 44.21	2.0608	18 15 22.4	5.602
8	4 43 47.95	2.0637	18 20 56.1	5.521
9	4 45 51.86	2.0666	18 26 24.9	5.439
10	4 47 55.94	2.0694	18 31 48.8	5.358
11	4 50 0.19	2.0723	18 37 7.8	5.276
12	4 52 4.62	2.0752	18 42 21.9	5.192
13	4 54 9.22	2.0780	18 47 30.9	5.108
14	4 56 13.98	2.0808	18 52 34.9	5.024
15	4 58 18.91	2.0836	18 57 33.8	4.939
16	5 0 24.01	2.0863	19 2 27.6	4.853
17	5 2 29.27	2.0891	19 7 16.2	4.768
18	5 4 34.70	2.0919	19 11 59.7	4.682
19	5 6 40.30	2.0947	19 16 38.0	4.594
20	5 8 46.06	2.0974	19 21 11.0	4.506
21	5 10 51.99	2.1001	19 25 38.7	4.417
22	5 12 58.08	2.1028	19 30 1.1	4.329
23	5 15 4.33	2.1056	19 34 18.2	4.240
24	5 17 10.75	2.1083	N.19 38 29.9	4.150

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SUNDAY 13.			
	h m s	s	° ′ ″	″
0	5 17 10.75	2.1083	N.19 38 29.9	4.150
1	5 19 17.33	2.1109	19 42 36.2	4.060
2	5 21 24.06	2.1135	19 46 37.1	3.969
3	5 23 30.95	2.1162	19 50 32.5	3.877
4	5 25 38.00	2.1188	19 54 22.4	3.786
5	5 27 45.20	2.1213	19 58 6.8	3.694
6	5 29 52.56	2.1239	20 1 45.7	3.602
7	5 32 0.07	2.1264	20 5 19.0	3.508
8	5 34 7.73	2.1289	20 8 46.7	3.414
9	5 36 15.54	2.1314	20 12 8.7	3.320
10	5 38 23.50	2.1339	20 15 25.1	3.225
11	5 40 31.61	2.1363	20 18 35.7	3.129
12	5 42 39.86	2.1387	20 21 40.6	3.033
13	5 44 48.25	2.1411	20 24 39.7	2.938
14	5 46 56.79	2.1435	20 27 33.1	2.842
15	5 49 5.47	2.1458	20 30 20.7	2.745
16	5 51 14.29	2.1481	20 33 2.5	2.647
17	5 53 23.24	2.1503	20 35 38.4	2.549
18	5 55 32.33	2.1526	20 38 8.4	2.451
19	5 57 41.55	2.1548	20 40 32.5	2.352
20	5 59 50.91	2.1571	20 42 50.7	2.253
21	6 2 0.40	2.1592	20 45 2.9	2.154
22	6 4 10.01	2.1613	20 47 9.2	2.054
23	6 6 19.75	2.1634	N.20 49 9.4	1.953
	MONDAY 14.			
0	6 8 29.62	2.1655	N.20 51 3.6	1.853
1	6 10 39.61	2.1675	20 52 51.8	1.752
2	6 12 49.72	2.1695	20 54 33.9	1.651
3	6 14 59.95	2.1714	20 56 9.9	1.549
4	6 17 10.29	2.1733	20 57 39.8	1.447
5	6 19 20.75	2.1753	20 59 3.6	1.345
6	6 21 31.33	2.1772	21 0 21.2	1.242
7	6 23 42.02	2.1790	21 1 32.6	1.139
8	6 25 52.81	2.1807	21 2 37.8	1.036
9	6 28 3.71	2.1825	21 3 36.9	0.933
10	6 30 14.71	2.1842	21 4 29.8	0.829
11	6 32 25.81	2.1859	21 5 16.4	0.724
12	6 34 37.02	2.1876	21 5 56.7	0.619
13	6 36 48.32	2.1892	21 6 30.7	0.515
14	6 38 59.72	2.1909	21 6 58.5	0.411
15	6 41 11.22	2.1924	21 7 20.0	0.306
16	6 43 22.81	2.1938	21 7 35.2	0.200
17	6 45 34.48	2.1953	21 7 44.0	+ 0.094
18	6 47 46.24	2.1968	21 7 46.5	− 0.012
19	6 49 58.09	2.1982	21 7 42.6	0.117
20	6 52 10.02	2.1995	21 7 32.4	0.223
21	6 54 22.03	2.2008	21 7 15.8	0.330
22	6 56 34.12	2.2021	21 6 52.8	0.437
23	6 58 46.28	2.2033	21 6 23.4	0.543
24	7 0 58.52	2.2046	N.21 5 47.6	0.650

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	TUESDAY 15.			
	h m s	s	° ′ ″	″
0	7 0 58.52	2.2046	N.21 5 47.6	0.650
1	7 3 10.83	2.2058	21 5 5.4	0.757
2	7 5 23.21	2.2069	21 4 16.7	0.865
3	7 7 35.66	2.2080	21 3 21.6	0.972
4	7 9 48.17	2.2090	21 2 20.1	1.079
5	7 12 0.74	2.2100	21 1 12.1	1.187
6	7 14 13.37	2.2110	20 59 57.7	1.294
7	7 16 26.06	2.2119	20 58 36.8	1.402
8	7 18 38.80	2.2128	20 57 9.4	1.510
9	7 20 51.60	2.2137	20 55 35.6	1.618
10	7 23 4.45	2.2146	20 53 55.3	1.726
11	7 25 17.35	2.2154	20 52 8.5	1.834
12	7 27 30.30	2.2162	20 50 15.2	1.942
13	7 29 43.29	2.2169	20 48 15.4	2.051
14	7 31 56.32	2.2176	20 46 9.1	2.159
15	7 34 9.40	2.2182	20 43 56.3	2.267
16	7 36 22.51	2.2188	20 41 37.1	2.374
17	7 38 35.66	2.2194	20 39 11.4	2.482
18	7 40 48.84	2.2199	20 36 39.2	2.591
19	7 43 2.05	2.2204	20 34 0.5	2.699
20	7 45 15.29	2.2209	20 31 15.3	2.807
21	7 47 28.56	2.2214	20 28 23.6	2.916
22	7 49 41.86	2.2219	20 25 25.4	3.023
23	7 51 55.19	2.2223	N.20 22 20.8	3.131
	WEDNESDAY 16.			
0	7 54 8.54	2.2227	N.20 19 9.7	3.239
1	7 56 21.91	2.2229	20 15 52.1	3.347
2	7 58 35.29	2.2232	20 12 28.0	3.455
3	8 0 46.69	2.2234	20 8 57.5	3.562
4	8 3 2.10	2.2237	20 5 20.5	3.670
5	8 5 15.53	2.2239	20 1 37.1	3.777
6	8 7 28.97	2.2241	19 57 47.3	3.884
7	8 9 42.42	2.2242	19 53 51.0	3.991
8	8 11 55.87	2.2243	19 49 48.3	4.098
9	8 14 9.33	2.2244	19 45 39.2	4.205
10	8 16 22.80	2.2245	19 41 23.7	4.312
11	8 18 36.27	2.2245	19 37 1.8	4.418
12	8 20 49.74	2.2245	19 32 33.5	4.524
13	8 23 3.21	2.2245	19 27 58.9	4.630
14	8 25 16.68	2.2244	19 23 17.9	4.737
15	8 27 30 14	2 2243	19 18 30.5	4.843
16	8 29 43.60	2.2242	19 13 36.8	4.948
17	8 31 57.05	2.2241	19 8 36.8	5.033
18	8 34 10.49	2.2240	19 3 30.5	5.158
19	8 36 23.93	2.2239	18 58 17.9	5.263
20	8 38 37.36	2.2238	18 52 59.0	5.367
21	8 40 50.78	2.2236	18 47 33.9	5.470
22	8 43 4.19	2.2233	18 42 2.6	5.574
23	8 45 17.58	2.2231	18 36 25.0	5.678
24	8 47 30.96	2.2228	N.18 30 41.2	5.781

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	THURSDAY 17.			
	h m s	s	° ′ ″	″
0	8 47 30.96	2.2238	N.18 30 41.2	5.781
1	8 49 44.32	2.2226	18 24 51.3	5.884
2	8 51 57.67	2.2223	18 18 55.2	5.987
3	8 54 11.00	2.2220	18 12 52.9	6.089
4	8 56 24.31	2.2217	18 6 44.5	6.191
5	8 58 37.60	2.2213	18 0 30.0	6.292
6	9 0 50.87	2.2210	17 54 9.4	6.393
7	9 3 4.12	2.2207	17 47 42.8	6.494
8	9 5 17.35	2.2203	17 41 10.1	6.595
9	9 7 30.56	2.2200	17 34 31.4	6.695
10	9 9 43.75	2.2196	17 27 46.7	6.795
11	9 11 56.91	2.2192	17 20 56.0	6.895
12	9 14 10.05	2.2188	17 13 59.3	6.994
13	9 16 23.17	2.2184	17 6 56.7	7.092
14	9 18 36.26	2.2180	16 59 48.3	7.189
15	9 20 49.33	2.2176	16 52 34.0	7.287
16	9 23 2.37	2.2172	16 45 13.8	7.385
17	9 25 15.39	2.2168	16 37 47.8	7.481
18	9 27 28.39	2.2164	16 30 16.1	7.577
19	9 29 41.36	2.2160	16 22 38.6	7.672
20	9 31 54.31	2.2156	16 14 55.4	7.768
21	9 34 7.23	2.2152	16 7 6.4	7.863
22	9 36 20.13	2.2147	15 59 11.8	7.958
23	9 38 33.00	2.2143	N.15 51 11.5	8.052
	FRIDAY 18.			
0	9 40 45.85	2.2139	N.15 43 5.6	8.145
1	9 42 58.67	2.2135	15 34 54.1	8.237
2	9 45 11.47	2.2131	15 26 37.1	8.329
3	9 47 24.25	2.2127	15 18 14.6	8.421
4	9 49 37.00	2.2123	15 9 46.6	8.512
5	9 51 49.73	2.2120	15 1 13.2	8.602
6	9 54 2.44	2.2117	14 52 34.3	8.692
7	9 56 15.13	2.2113	14 43 50.1	8.782
8	9 58 27.80	2.2109	14 35 0.5	8.871
9	10 0 40.44	2.2105	14 26 5.6	8.959
10	10 2 53.06	2.2102	14 17 5.4	9.047
11	10 5 5.67	2.2100	14 8 0.0	9.134
12	10 7 18.26	2.2097	13 58 49.4	9.220
13	10 9 30.83	2.2094	13 49 33.6	9.306
14	10 11 43.38	2.2091	13 40 12.7	9.391
15	10 13 55.92	2.2089	13 30 46.7	9.475
16	10 16 8.45	2.2087	13 21 15.7	9.558
17	10 18 20.96	2.2084	13 11 39.7	9.641
18	10 20 33.46	2.2082	13 1 58.7	9.724
19	10 22 45.95	2.2081	12 52 12.8	9.806
20	10 24 58.43	2.2079	12 42 22.0	9.887
21	10 27 10.89	2.2077	12 32 26.3	9.968
22	10 29 23.35	2.2077	12 22 25.8	10.047
23	10 31 35.81	2.2076	12 12 20.6	10.126
24	10 33 48.26	2.2075	N.12 2 10.7	10.204

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY 19.			
	h m s	s	° ′ ″	″
0	10 33 48.26	2.2075	N.12 2 10.7	10.204
1	10 36 0.71	2.2075	11 51 56.1	10.282
2	10 38 13.16	2.2074	11 41 36.9	10.358
3	10 40 25.60	2.2074	11 31 13.1	10.434
4	10 42 38.05	2.2075	11 20 44.8	10.509
5	10 44 50.50	2.2076	11 10 12.0	10.583
6	10 47 2.96	2.2077	10 59 34.8	10.657
7	10 49 15.42	2.2078	10 48 53.2	10.730
8	10 51 27.89	2.2079	10 38 7.2	10.802
9	10 53 40.37	2.2081	10 27 17.0	10.873
10	10 55 52.86	2.2083	10 16 22.5	10.943
11	10 58 5.37	2.2086	10 5 23.8	11.012
12	11 0 17.89	2.2089	9 54 21.0	11.081
13	11 2 30.43	2.2092	9 43 14.1	11.149
14	11 4 42.99	2.2095	9 32 3.1	11.216
15	11 6 55.57	2.2098	9 20 48.2	11.281
16	11 9 8.17	2.2102	9 9 29.4	11.346
17	11 11 20.80	2.2107	8 58 6.7	11.411
18	11 13 33.46	2.2112	8 46 40.1	11.474
19	11 15 46.15	2.2117	8 35 9.8	11.536
20	11 17 58.87	2.2122	8 23 35.8	11.597
21	11 20 11.62	2.2128	8 11 58.1	11.658
22	11 22 24.41	2.2135	8 0 16.8	11.718
23	11 24 37.24	2.2142	N. 7 48 31.9	11.777
	SUNDAY 20.			
0	11 26 50.12	2.2150	N. 7 36 43.5	11.835
1	11 29 3.04	2.2157	7 24 51.7	11.891
2	11 31 16.00	2.2164	7 12 56.6	11.946
3	11 33 29.01	2.2172	7 0 58.2	12.001
4	11 35 42.07	2.2181	6 48 56.5	12.055
5	11 37 55.19	2.2191	6 36 51.6	12.107
6	11 40 8.36	2.2200	6 24 43.6	12.158
7	11 42 21.59	2.2211	6 12 32.6	12.208
8	11 44 34.89	2.2222	6 0 18.6	12.258
9	11 46 48.25	2.2233	5 48 1.6	12.307
10	11 49 1.67	2.2244	5 35 41.7	12.355
11	11 51 15.17	2.2256	5 23 19.0	12.401
12	11 53 28.74	2.2268	5 10 53.6	12.446
13	11 55 42.39	2.2281	4 58 25.5	12.490
14	11 57 56.11	2.2294	4 45 54.8	12.532
15	12 0 9.91	2.2307	4 33 21.6	12.574
16	12 2 23.79	2.2321	4 20 45.9	12.615
17	12 4 37.76	2.2336	4 8 7.8	12.654
18	12 6 51.82	2.2351	3 55 27.4	12.692
19	12 9 5.97	2.2366	3 42 44.7	12.730
20	12 11 20.21	2.2382	3 29 59.8	12.766
21	12 13 34.55	2.2399	3 17 12.8	12.800
22	12 15 48.99	2.2416	3 4 23.8	12.832
23	12 18 3.54	2.2433	2 51 32.9	12.864
24	12 20 18.19	2.2451	N. 2 38 40.1	12.896

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	MONDAY 21.			
	h m s	s	° ′ ″	″
0	12 20 18.19	2.2451	N. 2 38 40.1	12.896
1	12 22 32.95	2.2469	2 25 45.4	12.926
2	12 24 47.82	2.2488	2 12 49.0	12.954
3	12 27 2.80	2.2507	1 59 50.9	12.982
4	12 29 17.90	2.2527	1 46 51.2	13.008
5	12 31 33.12	2.2547	1 33 50.0	13.032
6	12 33 48.47	2.2568	1 20 47.4	13.055
7	12 36 3.94	2.2589	1 7 43.4	13.077
8	12 38 19.54	2.2611	0 54 38.1	13.097
9	12 40 35.27	2.2633	0 41 31.7	13.116
10	12 42 51.14	2.2656	0 28 24.2	13.134
11	12 45 7.15	2.2679	0 15 15.6	13.151
12	12 47 23.29	2.2703	N. 0 2 6.1	13.166
13	12 49 39.58	2.2727	S. 0 11 4.3	13.180
14	12 51 56.01	2.2751	0 24 15.5	13.192
15	12 54 12.59	2.2776	0 37 27.3	13.202
16	12 56 29.32	2.2802	0 50 39.7	13.212
17	12 58 46.21	2.2828	1 3 52.7	13.221
18	13 1 3.26	2.2855	1 17 6.2	13.227
19	13 3 20.47	2.2882	1 30 20.0	13.232
20	13 5 37.84	2.2909	1 43 34.0	13.235
21	13 7 55.37	2.2936	1 56 48.2	13.237
22	13 10 13.07	2.2965	2 10 2.5	13.238
23	13 12 30.95	2.2994	S. 2 23 16.8	13.237
	TUESDAY 22.			
0	13 14 49.00	2.3023	S. 2 36 30.9	13.234
1	13 17 7.23	2.3053	2 49 44.8	13.230
2	13 19 25.64	2.3082	3 2 58.5	13.226
3	13 21 44.22	2.3112	3 16 11.9	13.219
4	13 24 2.99	2.3144	3 29 24.8	13.210
5	13 26 21.95	2.3176	3 42 37.1	13.199
6	13 28 41.10	2.3208	3 55 48.7	13.187
7	13 31 0.44	2.3240	4 8 59.6	13.174
8	13 33 19.98	2.3273	4 22 9.6	13.159
9	13 35 39.72	2.3306	4 35 18.7	13.143
10	13 37 59.65	2.3339	4 48 26.8	13.125
11	13 40 19.79	2.3373	5 1 33.7	13.105
12	13 42 40.13	2.3407	5 14 39.4	13.084
13	13 45 0.68	2.3442	5 27 43.8	13.061
14	13 47 21.44	2.3477	5 40 46.7	13.036
15	13 49 42.41	2.3512	5 53 48.1	13.010
16	13 52 3.59	2.3547	6 6 47.9	12.982
17	13 54 24.98	2.3583	6 19 45.9	12.952
18	13 56 46.59	2.3620	6 32 42.1	12.921
19	13 59 8.42	2.3657	6 45 36.4	12.888
20	14 1 30.47	2.3694	6 58 28.6	12.853
21	14 3 52.75	2.3731	7 11 18.7	12.817
22	14 6 15.25	2.3768	7 24 6.6	12.779
23	14 8 37.97	2.3806	7 36 52.2	12.739
24	14 11 0.92	2.3844	S. 7 49 35.3	12.697
	WEDNESDAY 23.			
	h m s	s	° ′ ″	″
0	14 11 0.92	2.3844	S. 7 49 35.3	12.697
1	14 13 24.10	2.3882	8 2 15.9	12.654
2	14 15 47.51	2.3921	8 14 53.8	12.609
3	14 18 11.15	2.3960	8 27 29.0	12.562
4	14 20 35.03	2.3999	8 40 1.3	12.513
5	14 22 59.14	2.4038	8 52 30.6	12.463
6	14 25 23.48	2.4077	9 4 56.9	12.412
7	14 27 48.06	2.4117	9 17 20.0	12.358
8	14 30 12.88	2.4157	9 29 39.8	12.303
9	14 32 37.94	2.4197	9 41 56.3	12.246
10	14 35 3.24	2.4237	9 54 9.3	12.187
11	14 37 28.78	2.4276	10 6 18.7	12.126
12	14 39 54.55	2.4316	10 18 24.4	12.063
13	14 42 20.57	2.4357	10 30 26.3	11.999
14	14 44 46.83	2.4397	10 42 24.3	11.934
15	14 47 13.34	2.4438	10 54 18.4	11.867
16	14 49 40.09	2.4478	11 6 8.3	11.797
17	14 52 7.08	2.4518	11 17 54.0	11.726
18	14 54 34.31	2.4559	11 29 35.4	11.653
19	14 57 1.79	2.4600	11 41 12.4	11.579
20	14 59 29.51	2.4640	11 52 44.9	11.502
21	15 1 57.47	2.4680	12 4 12.7	11.424
22	15 4 25.67	2.4720	12 15 35.8	11.345
23	15 6 54.11	2.4761	S. 12 26 54.1	11.264
	THURSDAY 24.			
0	15 9 22.80	2.4801	S. 12 38 7.5	11.181
1	15 11 51.73	2.4841	12 49 15.8	11.096
2	15 14 20.89	2.4880	13 0 19.0	11.010
3	15 16 50.29	2.4920	13 11 17.0	10.922
4	15 19 19.93	2.4959	13 22 9.7	10.832
5	15 21 49.80	2.4997	13 32 56.9	10.741
6	15 24 19.90	2.5036	13 43 38.6	10.648
7	15 26 50.23	2.5075	13 54 14.7	10.553
8	15 29 20.80	2.5114	14 4 45.0	10.457
9	15 31 51.60	2.5152	14 15 9.5	10.359
10	15 34 22.63	2.5190	14 25 28.1	10.260
11	15 36 53.88	2.5227	14 35 40.7	10.158
12	15 39 25.36	2.5265	14 45 47.1	10.055
13	15 41 57.06	2.5302	14 55 47.3	9.952
14	15 44 28.98	2.5338	15 5 41.3	9.847
15	15 47 1.11	2.5373	15 15 28.9	9.739
16	15 49 33.46	2.5409	15 25 10.0	9.631
17	15 52 6.02	2.5444	15 34 44.6	9.521
18	15 54 38.79	2.5478	15 44 12.5	9.409
19	15 57 11.76	2.5512	15 53 33.7	9.296
20	15 59 44.93	2.5545	16 2 48.0	9.181
21	16 2 18.30	2.5578	16 11 55.4	9.065
22	16 4 51.87	2.5611	16 20 55.8	8.947
23	16 7 25.64	2.5644	16 29 49.1	8.828
24	16 9 59.60	2.5675	S. 16 38 35.2	8.708

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	FRIDAY 25.			
	h m s	s	° ′ ″	″
0	16 9 59.60	2.5675	S. 16 38 35.2	8.708
1	16 12 33.74	2.5705	16 47 14.1	8.587
2	16 15 8.06	2.5734	16 55 45.7	8.464
3	16 17 42.55	2.5763	17 4 9.8	8.340
4	16 20 17.22	2.5791	17 12 26.5	8.216
5	16 22 52.05	2.5819	17 20 35.7	8.089
6	16 25 27.05	2.5847	17 28 37.2	7.961
7	16 28 2.21	2.5873	17 36 31.0	7.832
8	16 30 37.52	2.5898	17 44 17.1	7.702
9	16 33 12.98	2.5923	17 51 55.3	7.571
10	16 35 48.59	2.5946	17 59 25.6	7.439
11	16 38 24.33	2.5969	18 6 48.0	7.306
12	16 41 0.21	2.5991	18 14 2.3	7.171
13	16 43 36.22	2.6012	18 21 8.5	7.036
14	16 46 12.35	2.6032	18 28 6.6	6.900
15	16 48 48.60	2.6052	18 34 56.5	6.762
16	16 51 24.97	2.6071	18 41 38.1	6.624
17	16 54 1.45	2.6088	18 48 11.4	6.484
18	16 56 38.03	2.6104	18 54 36.2	6.343
19	16 59 14.70	2.6119	19 0 52.6	6.203
20	17 1 51.46	2.6134	19 7 0.5	6.062
21	17 4 28.31	2.6147	19 13 0.0	5.920
22	17 7 5.23	2.6159	19 18 50.9	5.777
23	17 9 42.22	2.6171	S. 19 24 33.2	5.632
	SATURDAY 26.			
0	17 12 19.28	2.6182	S. 19 30 6.8	5.487
1	17 14 56.40	2.6191	19 35 31.7	5.342
2	17 17 33.57	2.6198	19 40 47.9	5.197
3	17 20 10.78	2.6205	19 45 55.3	5.050
4	17 22 48.03	2.6212	19 50 53.9	4.902
5	17 25 25.32	2.6217	19 55 43.6	4.755
6	17 28 2.64	2.6221	20 0 24.5	4.607
7	17 30 39.97	2.6223	20 4 56.5	4.459
8	17 33 17.31	2.6224	20 9 19.6	4.310
9	17 35 54.66	2.6224	20 13 33.7	4.160
10	17 38 32.00	2.6223	20 17 38.8	4.011
11	17 41 9.34	2.6221	20 21 35.0	3.862
12	17 43 46.66	2.6218	20 25 22.2	3.712
13	17 46 23.96	2.6214	20 29 0.4	3.561
14	17 49 1.23	2.6208	20 32 29.5	3.410
15	17 51 38.46	2.6201	20 35 49.6	3.259
16	17 54 15.64	2.6193	20 39 0.6	3.108
17	17 56 52.78	2.6185	20 42 2.6	2.957
18	17 59 29.86	2.6174	20 44 55.5	2.806
19	18 2 6.87	2.6162	20 47 39.3	2.655
20	18 4 43.81	2.6150	20 50 14.1	2.504
21	18 7 20.67	2.6136	20 52 39.8	2.353
22	18 9 57.44	2.6121	20 54 56.5	2.202
23	18 12 34.12	2.6105	20 57 4.1	2.051
24	18 15 10.70	2.6087	S. 20 59 2.6	1.900
	SUNDAY 27.			
	h m s	s	° ′ ″	″
0	18 15 10.70	2.6087	S. 20 59 2.6	1.900
1	18 17 47.17	2.6068	21 0 52.1	1.750
2	18 20 23.52	2.6048	21 2 32.6	1.599
3	18 22 59.75	2.6027	21 4 4.0	1.449
4	18 25 35.85	2.6006	21 5 26.4	1.299
5	18 28 11.82	2.5983	21 6 39.9	1.150
6	18 30 47.65	2.5958	21 7 44.4	1.000
7	18 33 23.32	2.5933	21 8 39.9	0.851
8	18 35 58.84	2.5907	21 9 23.5	0.702
9	18 38 34.20	2.5879	21 10 4.2	0.554
10	18 41 9.39	2.5850	21 10 33.0	0.407
11	18 43 44.40	2.5820	21 10 53.0	0.260
12	18 46 19.23	2.5789	21 11 4.2	−0.113
13	18 48 53.87	2.5757	21 11 6.6	+0.033
14	18 51 28.31	2.5723	21 11 0.2	0.179
15	18 54 2.55	2.5689	21 10 45.1	0.324
16	18 56 36.58	2.5654	21 10 21.3	0.469
17	18 59 10.40	2.5618	21 9 48.8	0.613
18	19 1 44.00	2.5581	21 9 7.7	0.757
19	19 4 17.37	2.5543	21 8 18.0	0.899
20	19 6 50.51	2.5504	21 7 19.8	1.040
21	19 9 23.42	2.5464	21 6 13.2	1.181
22	19 11 56.08	2.5422	21 4 58.1	1.322
23	19 14 28.49	2.5380	S. 21 3 34.6	1.461
	MONDAY 28.			
0	19 17 0.64	2.5337	S. 21 2 2.8	1.599
1	19 19 32.54	2.5294	21 0 22.7	1.737
2	19 22 4.17	2.5249	20 58 34.3	1.875
3	19 24 35.53	2.5204	20 56 37.7	2.011
4	19 27 6.62	2.5158	20 54 33.0	2.147
5	19 29 37.43	2.5112	20 52 20.1	2.282
6	19 32 7.96	2.5064	20 49 59.2	2.415
7	19 34 38.20	2.5015	20 47 30.3	2.547
8	19 37 8.14	2.4966	20 44 53.5	2.678
9	19 39 37.79	2.4917	20 42 8.9	2.808
10	19 42 7.14	2.4866	20 39 16.5	2.938
11	19 44 36.18	2.4814	20 36 16.3	3.068
12	19 47 4.90	2.4761	20 33 8.3	3.197
13	19 49 33.31	2.4709	20 29 52.7	3.323
14	19 52 1.41	2.4656	20 26 29.6	3.448
15	19 54 29.19	2.4602	20 22 59.0	3.573
16	19 56 56.64	2.4548	20 19 20.9	3.696
17	19 59 23.77	2.4494	20 15 35.5	3.818
18	20 1 50.57	2.4438	20 11 42.8	3.939
19	20 4 17.03	2.4382	20 7 42.8	4.060
20	20 6 43.16	2.4326	20 3 35.6	4.178
21	20 9 8.95	2.4269	19 59 21.4	4.296
22	20 11 34.39	2.4212	19 55 0.1	4.413
23	20 13 59.49	2.4154	19 50 31.8	4.529
24	20 16 24.24	2.4096	S. 19 45 56.6	4.644

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

TUESDAY 29.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	20 16 24.24	2.4096	S. 19 45 56.6	4.644
1	20 18 48.64	2.4037	19 41 14.5	4.757
2	20 21 12.69	2.3979	19 36 25.7	4.869
3	20 23 36.39	2.3920	19 31 30.2	4.980
4	20 25 59.73	2.3860	19 26 28.1	5.090
5	20 28 22.71	2.3801	19 21 19.4	5.199
6	20 30 45.34	2.3741	19 16 4.2	5.307
7	20 33 7.61	2.3681	19 10 42.6	5.413
8	20 35 29.51	2.3620	19 5 14.6	5.519
9	20 37 51.05	2.3560	18 59 40.3	5.623
10	20 40 12.23	2.3499	18 53 59.8	5.726
11	20 42 33.04	2.3438	18 48 13.2	5.827
12	20 44 53.49	2.3377	18 42 20.6	5.927
13	20 47 13.57	2.3316	18 36 22.0	6.027
14	20 49 33.28	2.3255	18 30 17.4	6.125
15	20 51 52.63	2.3194	18 24 7.0	6.222
16	20 54 11.61	2.3132	18 17 50.8	6.317
17	20 56 30.22	2.3071	18 11 28.9	6.412
18	20 58 48.46	2.3009	18 5 1.3	6.506
19	21 1 6.33	2.2948	17 58 28.2	6.598
20	21 3 23.83	2.2887	17 51 49.6	6.688
21	21 5 40.97	2.2826	17 45 5.6	6.778
22	21 7 57.74	2.2764	17 38 16.3	6.867
23	21 10 14.14	2.2702	S. 17 31 21.6	6.955

WEDNESDAY 30.

0	21 12 30.17	2.2641	S. 17 24 21.7	7.041
1	21 14 45.83	2.2580	17 17 16.7	7.126
2	21 17 1.13	2.2520	17 10 6.6	7.210
3	21 19 16.07	2.2459	17 2 51.5	7.292
4	21 21 30.64	2.2398	16 55 31.5	7.373
5	21 23 44.85	2.2337	16 48 6.7	7.454
6	21 25 58.69	2.2277	16 40 37.0	7.534
7	21 28 12.17	2.2217	16 33 2.6	7.612
8	21 30 25.29	2.2157	16 25 23.6	7.688
9	21 32 38.06	2.2098	16 17 40.0	7.764
10	21 34 50.47	2.2038	16 9 51.9	7.839
11	21 37 2.52	2.1979	16 1 59.3	7.913
12	21 39 14.22	2.1921	15 54 2.3	7.986
13	21 41 25.57	2.1862	15 46 1.0	8.057
14	21 43 36.57	2.1803	15 37 55.5	8.127
15	21 45 47.21	2.1744	15 29 45.8	8.196
16	21 47 57.50	2.1687	15 21 32.0	8.264
17	21 50 7.45	2.1630	15 13 14.2	8.331
18	21 52 17.06	2.1572	15 4 52.3	8.397
19	21 54 26.32	2.1515	14 56 26.5	8.462
20	21 56 35.24	2.1459	14 47 56.9	8.525
21	21 58 43.83	2.1403	14 39 23.5	8.587
22	22 0 52.08	2.1347	14 30 46.4	8.649
23	22 3 0.00	2.1292	14 22 5.6	8.710
24	22 5 7.59	2.1237	S. 14 13 21.2	8.769

THURSDAY 31.

Hour.	Right Ascension	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	22 5 7.59	2.1237	S. 14 13 21.2	8.769
1	22 7 14.85	2.1182	14 4 33.3	8.827
2	22 9 21.78	2.1128	13 55 41.9	8.885
3	22 11 28.39	2.1075	13 46 47.1	8.942
4	22 13 34.68	2.1021	13 37 48.9	8.997
5	22 15 40.65	2.0968	13 28 47.4	9.051
6	22 17 46.30	2.0916	13 19 42.7	9.104
7	22 19 51.64	2.0864	13 10 34.9	9.157
8	22 21 56.67	2.0813	13 1 23.9	9.209
9	22 24 1.40	2.0762	12 52 9.8	9.260
10	22 26 5.82	2.0712	12 42 52.7	9.309
11	22 28 9.94	2.0662	12 33 32.7	9.357
12	22 30 13.76	2.0612	12 24 9.8	9.405
13	22 32 17.29	2.0563	12 14 44.1	9.451
14	22 34 20.52	2.0514	12 5 15.7	9.497
15	22 36 23.46	2.0466	11 55 44.5	9.542
16	22 38 26.12	2.0419	11 46 10.6	9.586
17	22 40 28.49	2.0372	11 36 34.1	9.629
18	22 42 30.58	2.0325	11 26 55.1	9.671
19	22 44 32.39	2.0279	11 17 13.6	9.712
20	22 46 33.93	2.0234	11 7 29.7	9.752
21	22 48 35.20	2.0189	10 57 43.4	9.792
22	22 50 36.20	2.0145	10 47 54.7	9.831
23	22 52 36.94	2.0101	S. 10 38 3.7	9.868

FRIDAY, JUNE 1.

0	22 54 37.42	2.0058	S. 10 28 10.5	9.904

PHASES OF THE MOON.

	d	h	m
☾ Last Quarter . . May	2	11	47.1
● New Moon.	10	13	23.5
☽ First Quarter	18	11	5.2
○ Full Moon	25	1	40.1

	d	h
☾ Apogee . . . . May	9	12.9
☾ Perigee	24	6.7

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	III^h.	P. L. of Diff.	VI^h.	P. L. of Diff.	IX^h.	P. L. of Diff.
1	Spica W.	90° 59′ 0″	2507	92° 40′ 3″	2526	94° 20′ 40″	2544	96° 0′ 52″	2563
	JUPITER W.	49 13 41	2453	50 56 0	2471	52 37 54	2488	54 19 24	2506
	Antares W.	45 19 37	2574	46 59 8	2587	48 38 21	2600	50 17 16	2614
	Fomalhaut E.	44 5 25	3009	42 35 24	3064	41 6 30	3122	39 38 47	3184
	α Pegasi E.	60 16 55	2979	58 46 16	3016	57 16 23	3054	55 47 17	3095
	VENUS E.	89 12 6	2894	87 39 40	2915	86 7 40	2934	84 36 4	2954
	SUN E.	108 16 17	2817	106 42 11	2836	105 8 30	2855	103 35 14	2874
2	JUPITER W.	62 40 54	2590	64 20 3	2606	65 58 50	2623	67 37 14	2639
	Antares W.	58 27 3	2686	60 4 2	2701	61 40 41	2715	63 17 1	2730
	α Pegasi E.	48 34 47	3329	47 11 9	3386	45 48 36	3445	44 27 10	3509
	VENUS E.	77 4 16	3051	75 35 6	3069	74 6 19	3088	72 37 55	3106
	SUN E.	95 54 55	2967	94 24 1	2985	92 53 30	3004	91 23 22	3021
3	JUPITER W.	75 43 58	2715	77 20 18	2729	78 56 19	2743	80 32 2	2756
	Antares W.	71 13 54	2801	72 48 21	2814	74 22 31	2828	75 56 23	2841
	α Aquilæ W.	35 44 49	5127	36 40 6	4962	37 37 31	4817	38 36 53	4691
	VENUS E.	65 21 19	3193	63 55 2	3210	62 29 5	3225	61 3 26	3242
	SUN E.	83 58 0	3105	82 29 57	3121	81 2 13	3137	79 34 48	3152
4	JUPITER W.	88 26 15	2821	90 0 16	2832	91 34 2	2844	93 7 33	2855
	Antares W.	83 41 33	2903	85 13 48	2915	86 45 48	2927	88 17 33	2938
	α Aquilæ W.	43 57 4	4243	45 4 50	4180	46 13 35	4125	47 23 13	4075
	VENUS E.	53 59 45	3316	52 35 52	3330	51 12 15	3343	49 48 53	3357
	SUN E.	72 22 9	3223	70 56 27	3236	69 31 1	3249	68 5 50	3261
5	α Aquilæ W.	53 22 4	3892	54 35 32	3865	55 49 27	3841	57 3 47	3820
	VENUS E.	42 55 42	3416	41 33 44	3428	40 11 59	3439	38 50 27	3450
	SUN E.	61 3 26	3319	59 39 36	3330	58 15 59	3339	56 52 33	3350
6	α Aquilæ W.	63 20 21	3739	64 36 27	3727	65 52 45	3716	67 9 15	3707
	Fomalhaut W.	29 6 24	4179	30 15 10	4084	31 25 27	4002	32 37 5	3928
	VENUS E.	32 5 40	3500	30 45 16	3509	29 25 2	3519	28 4 59	3530
	SUN E.	49 58 7	3394	48 35 44	3402	47 13 30	3409	45 51 24	3416
7	α Aquilæ W.	73 33 55	3673	74 51 11	3668	76 8 32	3663	77 25 58	3660
	Fomalhaut W.	38 50 54	3679	40 8 3	3645	41 25 49	3614	42 44 8	3587
	SUN E.	39 3 1	3453	37 41 44	3460	36 20 35	3467	34 59 34	3473
8	α Aquilæ W.	83 53 52	3650	85 11 32	3650	86 29 12	3650	87 46 52	3650
	Fomalhaut W.	49 22 17	3485	50 42 58	3469	52 3 57	3454	53 25 12	3442
	SUN E.	28 16 27	3512	26 56 16	3520	25 36 14	3530	24 16 23	3542
12	SUN W.	16 17 44	3587	17 36 33	3557	18 55 54	3532	20 15 43	3509
	Pollux E.	44 58 59	3114	43 31 6	3114	42 3 14	3116	40 35 24	3118
	SATURN E.	53 24 27	3060	51 55 29	3057	50 26 27	3053	48 57 20	3048
	Regulus E.	80 24 33	3036	78 55 5	3032	77 25 32	3028	75 55 54	3024
13	SUN W.	27 0 0	3433	28 21 39	3421	29 43 32	3408	31 5 39	3397
	Pollux E.	33 16 51	3134	31 49 23	3140	30 22 2	3148	28 54 51	3158
	SATURN E.	41 30 18	3024	40 0 35	3019	38 30 46	3014	37 0 50	3008
	Regulus E.	68 26 20	3000	66 56 7	2994	65 25 47	2989	63 55 20	2982

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Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^h.	P. L. of Diff.	XVIII^h.	P. L. of Diff.	XXI^h.	P. L. of Diff.
1	Spica	W.	97° 40′ 28″	2581	99° 19′ 59″	2599	100° 58′ 56″	2616	102° 37′ 29″	2630
	Jupiter	W.	56 0 29	2523	57 41 10	2540	59 21 28	2557	61 1 22	2573
	Antares	W.	51 55 52	2628	53 34 9	2642	55 12 7	2657	56 49 45	2672
	Fomalhaut	E.	38 12 19	3253	36 47 12	3328	35 23 33	3411	34 1 29	3502
	α Pegasi	E.	54 19 1	3137	52 51 36	3180	51 25 3	3227	49 59 26	3276
	Venus	E.	83 4 53	2973	81 34 7	2993	80 3 46	3013	78 33 49	3032
	Sun	E.	102 2 22	2894	100 29 55	2912	98 57 52	2931	97 26 12	2949
2	Jupiter	W.	69 15 16	2654	70 52 57	2669	72 30 18	2685	74 7 18	2700
	Antares	W.	64 53 1	2744	66 28 42	2758	68 4 5	2772	69 39 9	2787
	α Pegasi	E.	43 6 56	3578	41 47 58	3652	40 30 20	3732	39 14 7	3820
	Venus	E.	71 9 53	3124	69 42 13	3142	68 14 54	3159	66 47 56	3177
	Sun	E.	89 53 35	3039	88 24 10	3056	86 55 6	3073	85 26 23	3089
3	Jupiter	W.	82 7 27	2770	83 42 34	2783	85 17 24	2795	86 51 58	2808
	Antares	W.	77 29 58	2854	79 3 16	2866	80 36 18	2880	82 9 3	2891
	α Aquilæ	W.	39 38 0	4579	40 40 43	4479	41 44 54	4391	42 50 23	4313
	Venus	E.	59 38 6	3257	58 13 4	3272	56 48 20	3288	55 23 54	3302
	Sun	E.	78 7 41	3167	76 40 52	3182	75 14 21	3196	73 48 7	3209
4	Jupiter	W.	94 40 50	2866	96 13 53	2876	97 46 43	2886	99 19 20	2895
	Antares	W.	89 49 4	2949	91 20 21	2959	92 51 25	2969	94 22 16	2979
	α Aquilæ	W.	48 33 39	4030	49 44 49	3989	50 56 39	3953	52 9 5	3920
	Venus	E.	48 25 47	3369	47 2 55	3381	45 40 17	3393	44 17 53	3405
	Sun	E.	66 40 53	3274	65 16 11	3286	63 51 43	3297	62 27 28	3308
5	α Aquilæ	W.	58 18 29	3800	59 33 31	3782	60 48 52	3767	62 4 29	3752
	Venus	E.	37 29 7	3460	36 7 58	3471	34 47 1	3480	33 26 15	3490
	Sun	E.	55 29 19	3359	54 6 16	3368	52 43 23	3377	51 20 40	3386
6	α Aquilæ	W.	68 25 55	3698	69 42 44	3691	70 59 41	3684	72 16 45	3678
	Fomalhaut	W.	33 49 56	3865	35 3 51	3810	36 18 43	3761	37 34 26	3718
	Venus	E.	26 45 8	3540	25 25 28	3550	24 5 59	3561	22 46 42	3561
	Sun	E.	44 29 26	3424	43 7 37	3432	41 45 57	3439	40 24 25	3446
7	α Aquilæ	W.	78 43 28	3657	80 1 1	3655	81 18 36	3653	82 36 13	3651
	Fomalhaut	W.	44 2 57	3562	45 22 13	3540	46 41 53	3520	48 1 55	3502
	Sun	E.	33 38 40	3480	32 17 54	3488	30 57 16	3496	29 36 47	3504
8	α Aquilæ	W.	89 4 32	3651	90 22 11	3652	91 39 49	3654	92 57 25	3657
	Fomalhaut	W.	54 46 41	3430	56 8 24	3419	57 30 19	3408	58 52 26	3400
	Sun	E.	22 56 45	3555	21 37 21	3569	20 18 13	3587	18 59 24	3609
12	Sun	W.	21 35 57	3490	22 56 32	3474	24 17 25	3459	25 38 35	3446
	Pollux	E.	39 7 36	3119	37 39 50	3121	36 12 6	3124	34 44 26	3129
	Saturn	E.	47 28 7	3043	45 58 48	3039	44 29 24	3034	42 59 54	3030
	Regulus	E.	74 26 11	3020	72 56 23	3014	71 26 28	3009	69 56 27	3005
13	Sun	W.	32 27 59	3386	33 50 31	3377	35 13 14	3366	36 36 9	3356
	Pollux	E.	27 27 52	3171	26 1 8	3188	24 34 44	3209	23 8 45	3235
	Saturn	E.	35 30 47	3001	34 0 36	2996	32 30 18	2989	30 59 51	2982
	Regulus	E.	62 24 45	2977	60 54 3	2970	59 23 13	2964	57 52 15	2958

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14	Sun W.	37° 59′ 16″	3345	39° 22′ 35″	3336	40° 46′ 5″	3325	42° 9′ 47″	3316
	Saturn E.	29 29 16	2975	27 58 32	2969	26 27 40	2962	24 56 39	2954
	Regulus E.	56 21 9	2950	54 49 54	2943	53 18 30	2936	51 46 57	2929
15	Sun W.	49 11 16	3263	50 36 11	3252	52 1 19	3240	53 26 41	3228
	Regulus E.	44 6 43	2887	42 34 8	2879	41 1 22	2869	39 28 24	2859
	Mars E.	88 3 4	2862	86 29 56	2854	84 56 38	2845	83 23 9	2836
	Spica E.	98 0 45	2916	96 28 47	2907	94 56 37	2898	93 24 15	2887
16	Sun W.	60 36 59	3168	62 3 46	3156	63 30 48	3142	64 58 7	3129
	Regulus E.	31 40 25	2810	30 6 10	2799	28 31 41	2788	26 56 58	2778
	Mars E.	75 32 41	2788	73 57 57	2777	72 22 59	2766	70 47 47	2756
	Spica E.	85 39 10	2835	84 5 28	2825	82 31 32	2813	80 57 21	2801
17	Sun W.	72 18 49	3058	73 47 50	3043	75 17 9	3028	76 46 47	3014
	Mars E.	62 48 6	2697	61 11 22	2685	59 34 22	2673	57 57 6	2660
	Spica E.	73 2 33	2741	71 26 47	2728	69 50 44	2715	68 14 24	2702
18	Sun W.	84 19 45	2933	85 51 22	2917	87 23 19	2901	88 55 37	2883
	Pollux W.	30 53 33	2733	32 29 29	2706	34 6 1	2680	35 43 8	2655
	Saturn W.	20 39 40	2618	22 18 10	2604	23 57 0	2588	25 36 12	2572
	Mars E.	49 46 24	2594	48 7 22	2581	46 28 1	2567	44 48 21	2554
	Spica E.	60 8 19	2635	58 30 11	2621	56 51 45	2608	55 13 1	2594
	Jupiter E.	99 40 42	2557	98 0 48	2542	96 20 33	2527	94 39 57	2511
19	Sun W.	96 42 37	2798	98 17 8	2780	99 52 2	2763	101 27 19	2744
	Pollux W.	43 56 45	2543	45 36 59	2522	47 17 41	2502	48 58 52	2482
	Saturn W.	33 57 41	2492	35 39 6	2475	37 20 55	2458	39 3 7	2442
	Mars E.	36 25 24	2488	34 43 54	2475	33 2 6	2463	31 20 1	2452
	Spica E.	46 54 43	2528	45 14 9	2516	43 33 18	2504	41 52 11	2493
	Jupiter E.	86 11 28	2432	84 28 39	2416	82 45 27	2400	81 1 52	2384
	Antares E.	92 48 33	2515	91 7 40	2498	89 26 24	2482	87 44 45	2465
20	Sun W.	109 29 34	2657	111 7 11	2640	112 45 11	2624	114 23 34	2607
	Pollux W.	57 31 39	2387	59 15 32	2368	60 59 52	2350	62 44 38	2333
	Saturn W.	47 39 58	2359	49 24 31	2344	51 9 27	2327	52 54 47	2311
	Regulus W.	21 20 30	2348	23 5 20	2330	24 50 36	2312	26 36 18	2294
	Spica E.	33 22 57	2450	31 40 33	2445	29 58 3	2443	28 15 30	2445
	Jupiter E.	72 18 8	2303	70 32 13	2287	68 45 55	2272	66 59 14	2256
	Antares E.	79 10 50	2386	77 26 55	2371	75 42 38	2355	73 57 59	2339
21	Sun W.	122 41 10	2526	124 21 47	2511	126 2 45	2496	127 44 4	2481
	Pollux W.	71 34 42	2250	73 21 55	2235	75 9 31	2219	76 57 30	2204
	Saturn W.	61 47 18	2233	63 34 56	2218	65 22 56	2204	67 11 18	2189
	Regulus W.	35 31 1	2214	37 19 8	2198	39 7 38	2183	40 56 31	2169
	Jupiter E.	58 0 4	2181	56 11 8	2167	54 21 50	2153	52 32 11	2139
	Antares E.	65 9 20	2269	63 22 35	2257	61 35 32	2245	59 48 11	2233
22	Pollux W.	86 2 43	2137	87 52 45	2126	89 43 4	2115	91 33 40	2104
	Saturn W.	76 18 18	2124	78 8 40	2113	79 59 20	2101	81 50 17	2091
	Regulus W.	50 6 11	2103	51 57 6	2090	53 48 20	2079	55 39 51	2069
	Jupiter E.	43 19 6	2079	41 27 35	2070	39 35 49	2060	37 43 48	2051

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14	Sun	W.	43° 33′ 40″	3306	44° 57′ 45″	3294	46° 22′ 3″	3284	47° 46′ 33″	3273
	Saturn	E.	23 25 28	2946	21 54 8	2939	20 22 38	2930	18 50 57	2921
	Regulus	E.	50 15 15	2921	48 43 23	2912	47 11 20	2905	45 39 7	2896
15	Sun	W.	54 52 17	3217	56 18 6	3205	57 44 9	3193	59 10 27	3181
	Regulus	E.	37 55 13	2850	36 21 50	2841	34 48 15	2831	33 14 27	2820
	Mars	E.	81 49 28	2827	80 15 35	2818	78 41 30	2808	77 7 12	2798
	Spica	E.	91 51 40	2878	90 18 53	2867	88 45 52	2857	87 12 38	2846
16	Sun	W.	66 25 42	3115	67 53 33	3101	69 21 41	3087	70 50 6	3073
	Regulus	E.	25 22 1	2767	23 46 50	2756	22 11 24	2745	20 35 44	2735
	Mars	E.	69 12 21	2744	67 36 40	2733	66 0 44	2722	64 24 33	2710
	Spica	E.	79 22 55	2789	77 48 13	2778	76 13 16	2766	74 38 3	2753
17	Sun	W.	78 16 43	2998	79 46 58	2982	81 17 33	2965	82 48 29	2950
	Mars	E.	56 19 33	2647	54 41 42	2635	53 3 34	2621	51 25 8	2608
	Spica	E.	66 37 47	2689	65 0 52	2675	63 23 39	2662	61 46 8	2649
18	Sun	W.	90 28 17	2866	92 1 19	2849	93 34 43	2832	95 8 29	2815
	Pollux	W.	37 20 49	2631	38 59 2	2608	40 37 46	2586	42 17 0	2564
	Saturn	W.	27 15 45	2556	28 55 40	2540	30 35 58	2524	32 16 38	2507
	Mars	E.	43 8 23	2540	41 28 6	2527	39 47 30	2514	38 6 36	2501
	Spica	E.	53 33 58	2581	51 54 37	2567	50 14 57	2554	48 34 59	2541
	Jupiter	E.	92 58 59	2496	91 17 40	2480	89 35 59	2464	87 53 55	2448
19	Sun	W.	103 3 0	2727	104 39 4	2710	106 15 31	2692	107 52 21	2675
	Pollux	W.	50 40 31	2462	52 22 37	2443	54 5 11	2424	55 48 12	2405
	Saturn	W.	40 45 42	2425	42 28 41	2409	44 12 3	2392	45 55 49	2376
	Mars	E.	29 37 40	2441	27 55 4	2431	26 12 14	2424	24 29 13	2417
	Spica	E.	40 10 48	2482	38 29 10	2472	36 47 18	2463	35 5 13	2455
	Jupiter	E.	79 17 54	2368	77 33 33	2351	75 48 48	2335	74 3 40	2319
	Antares	E.	86 2 44	2450	84 20 20	2433	82 37 33	2417	80 54 23	2401
20	Sun	W.	116 2 20	2590	117 41 29	2574	119 21 0	2557	121 0 54	2541
	Pollux	W.	64 29 49	2316	66 15 25	2299	68 1 26	2282	69 47 52	2266
	Saturn	W.	54 40 31	2294	56 26 39	2279	58 13 10	2264	60 0 3	2249
	Regulus	W.	28 22 26	2277	30 8 59	2261	31 55 56	2245	33 43 17	2229
	Spica	E.	26 32 59	2450	24 50 36	2461	23 8 28	2478	21 26 44	2504
	Jupiter	E.	65 12 9	2240	63 24 41	2225	61 36 51	2210	59 48 38	2196
	Antares	E.	72 12 57	2325	70 27 34	2311	68 41 50	2296	66 55 45	2283
21	Sun	W.	129 25 44	2467	131 7 43	2454	132 50 1	2442	134 32 36	2430
	Pollux	W.	78 45 51	2190	80 34 34	2176	82 23 37	2163	84 13 0	2150
	Saturn	W.	69 0 2	2176	70 49 6	2163	72 38 30	2149	74 28 14	2136
	Regulus	W.	42 45 46	2155	44 35 22	2141	46 25 18	2128	48 15 35	2115
	Jupiter	E.	50 42 12	2127	48 51 54	2114	47 1 16	2102	45 10 20	2090
	Antares	E.	58 0 32	2222	56 12 37	2211	54 24 26	2202	52 36 1	2193
22	Pollux	W.	93 24 33	2094	95 15 41	2085	97 7 3	2076	98 58 39	2068
	Saturn	W.	83 41 30	2081	85 32 58	2072	87 24 41	2062	89 16 39	2053
	Regulus	W.	57 31 38	2059	59 23 41	2049	61 15 59	2040	63 8 31	2032
	Jupiter	E.	35 51 33	2043	33 59 6	2036	32 6 28	2030	30 13 41	2026

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			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
22	Antares	E.	50 47 23	2186	48 58 34	2178	47 9 34	2173	45 20 26	2169
23	Regulus	W.	65 1 16	2024	66 54 13	2017	68 47 21	2010	70 40 39	2005
	Mars	W.	21 44 51	2108	23 35 38	2090	25 26 53	2075	27 18 31	2062
	Antares	E.	36 13 56	2174	34 24 50	2182	32 35 56	2194	30 47 19	2210
	α Aquilæ	E.	84 52 51	2610	83 14 10	2607	81 35 25	2607	79 56 40	2609
24	Regulus	W.	80 9 3	1987	82 2 58	1986	83 56 55	1985	85 50 53	1986
	Mars	W.	36 40 36	2026	38 33 30	2022	40 26 30	2020	42 19 33	2019
	Spica	W.	27 1 11	2139	28 51 10	2120	30 41 38	2105	32 32 29	2093
	α Aquilæ	E.	71 44 22	2650	70 6 33	2663	68 29 4	2681	66 51 58	2701
25	Regulus	W.	95 20 12	1998	97 13 49	2003	99 7 19	2009	101 0 40	2015
	Mars	W.	51 44 45	2028	53 37 36	2032	55 30 21	2037	57 22 58	2043
	Spica	W.	41 50 4	2068	43 41 52	2068	45 33 40	2070	47 25 26	2072
	α Aquilæ	E.	58 54 41	2854	57 21 23	2896	55 48 59	2942	54 17 34	2995
	Fomalhaut	E.	90 16 43	2227	88 28 55	2232	86 41 15	2238	84 53 44	2246
26	Mars	W.	66 43 12	2086	68 34 33	2096	70 25 38	2108	72 16 25	2120
	Spica	W.	56 42 41	2101	58 33 38	2110	60 24 22	2120	62 14 51	2130
	Jupiter	W.	17 57 48	2096	19 48 53	2093	21 40 3	2094	23 31 11	2098
	Fomalhaut	E.	75 59 36	2302	74 13 40	2317	72 28 6	2334	70 42 56	2351
27	Mars	W.	81 25 29	2189	83 14 13	2204	85 2 34	2220	86 50 31	2237
	Spica	W.	71 22 58	2192	73 11 37	2206	74 59 55	2221	76 47 51	2237
	Jupiter	W.	32 44 20	2144	34 34 12	2157	36 23 44	2170	38 12 56	2184
	Antares	W.	26 15 38	2403	27 59 8	2391	29 42 56	2384	31 26 54	2381
	Fomalhaut	E.	62 4 4	2460	60 21 55	2486	58 40 22	2514	56 59 28	2544
	α Pegasi	E.	78 14 15	2545	76 34 4	2566	74 54 22	2588	73 15 11	2612
28	Spica	W.	85 41 33	2320	87 27 3	2338	89 12 7	2356	90 56 45	2374
	Jupiter	W.	47 13 23	2263	49 0 17	2280	50 46 46	2297	52 32 50	2315
	Antares	W.	40 6 27	2405	41 49 55	2415	43 33 9	2425	45 16 8	2438
	Fomalhaut	E.	48 46 4	2722	47 9 54	2766	45 34 42	2813	44 0 31	2863
	α Pegasi	E.	65 7 53	2751	63 32 21	2784	61 57 32	2818	60 23 27	2853
29	Jupiter	W.	61 16 40	2405	63 0 8	2424	64 43 9	2442	66 25 44	2460
	Antares	W.	53 46 18	2510	55 27 18	2525	57 7 56	2542	58 48 11	2559
	α Pegasi	E.	52 45 20	3065	51 16 27	3114	49 48 35	3168	48 21 47	3224
	α Arietis	E.	94 11 6	2587	92 31 53	2605	90 53 5	2624	89 14 42	2643
	Sun	E.	126 38 19	2767	125 3 8	2787	123 28 23	2807	121 54 4	2826
30	Jupiter	W.	74 52 10	2552	76 32 11	2570	78 11 47	2588	79 50 58	2606
	Antares	W.	67 3 43	2643	68 41 40	2660	70 19 14	2676	71 56 26	2693
	α Arietis	E.	81 9 20	2741	79 33 34	2761	77 58 15	2781	76 23 22	2801
	Sun	E.	114 8 47	2924	112 36 59	2943	111 5 35	2963	109 34 36	2981
31	Jupiter	W.	88 0 58	2691	89 37 50	2707	91 14 20	2724	92 50 28	2739
	Antares	W.	79 56 48	2775	81 31 48	2792	83 6 26	2808	84 40 44	2824
	α Aquilæ	W.	41 29 28	4342	42 35 42	4262	43 43 10	4191	44 51 45	4128
	α Arietis	E.	68 35 32	2903	67 3 17	2924	65 31 29	2945	64 0 7	2966
	Sun	E.	102 5 30	3074	100 36 49	3091	99 8 28	3108	97 40 28	3125

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^h.	P. L. of Diff.	XVIII^h.	P. L. of Diff.	XXI^h.	P. L. of Diff.
22	Antares	E.	43° 31′ 11″	2166	41° 41′ 52″	2165	39° 52′ 31	2165	38° 3′ 11″	2169
23	Regulus	W.	72 34 6	2000	74 27 41	1995	76 21 23	1991	78 15 11	1989
	Mars	W.	29 10 29	2052	31 2 43	2043	32 55 10	2035	34 47 49	2030
	Antares	E.	28 59 6	2231	27 11 25	2260	25 24 26	2296	23 38 20	2344
	α Aquilæ	E.	78 17 57	2612	76 39 19	2618	75 0 48	2626	73 22 28	2636
24	Regulus	W.	87 44 50	1986	89 38 46	1988	91 32 39	1991	93 26 28	1994
	Mars	W.	44 12 38	2019	46 5 43	2019	47 58 47	2021	49 51 48	2024
	Spica	W.	34 23 39	2084	36 15 3	2077	38 6 37	2073	39 58 18	2070
	α Aquilæ	E.	65 15 19	2725	63 39 12	2751	62 3 40	2782	60 28 48	2816
25	Regulus	W.	102 53 51	2022	104 46 51	2030	106 39 39	2039	108 32 13	2048
	Mars	W.	59 15 25	2050	61 7 41	2058	62 59 45	2066	64 51 36	2076
	Spica	W.	49 17 8	2076	51 8 44	2081	53 0 13	2087	54 51 32	2094
	α Aquilæ	E.	52 47 15	3053	51 18 8	3118	49 50 20	3188	48 23 57	3268
	Fomalhaut	E.	83 6 25	2255	81 19 19	2264	79 32 27	2276	77 45 52	2289
26	Mars	W.	74 6 54	2133	75 57 3	2145	77 46 53	2159	79 36 22	2174
	Spica	W.	64 5 4	2141	65 55 1	2153	67 44 40	2166	69 33 59	2179
	Jupiter	W.	25 22 13	2105	27 13 5	2113	29 3 45	2122	30 54 11	2133
	Fomalhaut	E.	68 58 11	2370	67 13 53	2391	65 30 5	2412	63 46 48	2436
27	Mars	W.	88 38 4	2253	90 25 12	2271	92 11 54	2289	93 58 10	2307
	Spica	W.	78 35 23	2253	80 22 31	2269	82 9 16	2285	83 55 37	2302
	Jupiter	W.	40 1 47	2199	41 50 16	2214	43 38 22	2230	45 26 5	2247
	Antares	W.	33 10 56	2381	31 54 58	2384	36 38 56	2389	38 22 47	2396
	Fomalhaut	E.	55 19 16	2575	53 39 47	2608	52 1 3	2644	50 23 8	2682
	α Pegasi	E.	71 36 32	2637	69 58 27	2663	68 20 58	2691	66 44 6	2720
28	Spica	W.	92 40 57	2393	94 24 42	2412	96 8 0	2431	97 50 51	2449
	Jupiter	W.	54 18 28	2332	56 3 40	2350	57 48 26	2368	59 32 46	2387
	Antares	W.	46 58 49	2450	48 41 12	2465	50 23 15	2480	52 4 57	2494
	Fomalhaut	E.	42 27 25	2918	40 55 29	2977	39 24 47	3042	37 55 26	3112
	α Pegasi	E.	58 50 8	2891	57 17 38	2931	55 45 58	2973	54 15 11	3018
29	Jupiter	W.	68 7 53	2479	69 49 36	2497	71 30 53	2516	73 11 44	2534
	Antares	W.	60 28 3	2574	62 7 33	2591	63 46 40	2609	65 25 23	2626
	α Pegasi	E.	46 56 6	3285	45 31 37	3350	44 8 23	3420	42 46 29	3496
	α Arietis	E.	87 36 45	2662	85 59 14	2682	84 22 10	2701	82 45 32	2721
	Sun	E.	120 20 10	2845	118 46 41	2866	117 13 38	2885	115 41 0	2905
30	Jupiter	W.	81 29 45	2624	83 8 8	2640	84 46 8	2658	86 23 44	2675
	Antares	W.	73 33 15	2710	75 9 41	2727	76 45 45	2744	78 21 27	2760
	α Arietis	E.	74 48 55	2821	73 14 55	2842	71 41 21	2862	70 8 13	2883
	Sun	E.	108 4 0	3001	106 33 48	3019	105 3 59	3038	103 34 33	3056
31	Jupiter	W.	94 26 16	2754	96 1 44	2769	97 36 52	2785	99 11 40	2800
	Antares	W.	86 14 41	2839	87 48 18	2854	89 21 36	2869	90 54 35	2883
	α Aquilæ	W.	46 1 20	4072	47 11 49	4022	48 23 7	3977	49 35 9	3939
	α Arietis	E.	62 29 12	2987	60 58 43	3008	59 28 40	3030	57 59 4	3052
	Sun	E.	96 12 49	3142	94 45 30	3158	93 18 31	3174	91 51 51	3190

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Subtracted from / Added to Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Frid.	1	4 39 13.73	10.241	N.22 9 14.0	+19.72	15 48.24	68.45	2 21.58	0.384
Sat.	2	4 43 19.71	10.258	22 16 55.9	18.75	15 48.10	68.50	2 12.18	0.401
SUN.	3	4 47 26.09	10.274	22 24 14.5	17.78	15 47.97	68.55	2 2.38	0.417
Mon.	4	4 51 32.86	10.289	22 31 9.7	+16.80	15 47.84	68.60	1 52.20	0.432
Tues.	5	4 55 39.97	10.303	22 37 41.3	15.82	15 47.72	68.65	1 41.67	0.446
Wed.	6	4 59 47.42	10.316	22 43 49.2	14.83	15 47.60	68.69	1 30.80	0.459
Thur.	7	5 3 55.17	10.329	22 49 33 2	+13.83	15 47.49	68.73	1 19.63	0.472
Frid.	8	5 8 3.22	10.340	22 54 53.2	12.83	15 47.38	68.77	1 8.18	0.483
Sat.	9	5 12 11.53	10.351	22 59 49.1	11.82	15 47.27	68.80	0 56.46	0.494
SUN.	10	5 16 20.08	10.360	23 4 20.8	+10.81	15 47.17	68.83	0 44.51	0.503
Mon.	11	5 20 28.84	10.369	23 8 28.1	9.79	15 47.08	68.86	0 32.35	0.512
Tues.	12	5 24 37.78	10.376	23 12 10.9	8.77	15 46.99	68.89	0 19.99	0.519
Wed.	13	5 28 46.88	10.382	23 15 29.2	+ 7.75	15 46.90	68.91	0 7.47	0.525
Thur.	14	5 32 56.12	10.387	23 18 22.8	6.72	15 46.82	68.93	0 5.17	0.530
Frid.	15	5 37 5.46	10.391	23 20 51.8	5.69	15 46.75	68.94	0 17.91	0.534
Sat.	16	5 41 14.89	10.394	23 22 56.1	+ 4.66	15 46.68	68.96	0 30.75	0.537
SUN.	17	5 45 24.38	10.396	23 24 35.5	3.63	15 46.62	68.97	0 43.65	0.539
Mon.	18	5 49 33.91	10.397	23 25 50.2	2.60	15 46.56	68.97	0 56.58	0.540
Tues.	19	5 53 43.44	10.396	23 26 40.1	+ 1.56	15 46.51	68.97	1 9.52	0.540
Wed.	20	5 57 52.97	10.395	23 27 5.2	+ 0.52	15 46.46	68.97	1 22.45	0.539
Thur.	21	6 2 2.47	10.393	23 27 5.4	− 0.52	15 46.41	68.97	1 35.36	0.537
Frid.	22	6 6 11.92	10.391	23 26 40.8	− 1.55	15 46.36	68.96	1 48 22	0.534
Sat.	23	6 10 21.30	10.388	23 25 51.3	2.58	15 46.32	68.95	2 1.00	0.531
SUN.	24	6 14 30.58	10.384	23 24 37.1	3.61	15 46.28	68.94	2 13.68	0.527
Mon.	25	6 18 39.74	10.379	23 22 58.2	− 4.63	15 46.25	68.93	2 26.27	0.522
Tues.	26	6 22 48.79	10.373	23 20 54.7	5.66	15 46.22	68.91	2 38.74	0 516
Wed.	27	6 26 57.71	10.367	23 18 26.6	6.68	15 46.19	68.88	2 51.06	0.510
Thur.	28	6 31 6.47	10.360	23 15 33.9	− 7.70	15 46.17	68.86	3 3.22	0.503
Frid.	29	6 35 15.03	10.353	23 12 16.7	8.72	15 46.15	68.83	3 15.20	0.496
Sat.	30	6 39 23.39	10.344	23 8 35.2	9.73	15 46.13	68.80	3 26.96	0.487
SUN.	31	6 43 31.51	10.333	N.23 4 29.4	−10.74	15 46.12	68.76	3 38.49	0.476

NOTE.—The mean time of semidiameter passing may be found by subtracting 0s.19 from the sidereal time.
The sign + prefixed to the hourly change of declination indicates that north declinations are increasing; the sign − indicates that north declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	Diff. for 1 Hour.	THE SUN'S Apparent Declination.	Diff. for 1 Hour.	Equation of Time, to be Added to / Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	s	m s	s	h m s
Frid.	1	4 39 14.13	10.240	N. 22 9 14.8	+19.72	2 21.57	0.384	4 41 35.69
Sat.	2	4 43 20.09	10.257	22 16 56.6	18.75	2 12.17	0.401	4 45 32.25
SUN.	3	4 47 26.44	10.273	22 24 15.1	17.78	2 2.37	0.417	4 49 28.81
Mon.	4	4 51 33.18	10.288	22 31 10.2	+16.80	1 52.19	0.432	4 53 25.36
Tues.	5	4 55 40.26	10.302	22 37 41.8	15.82	1 41.66	0.446	4 57 21.92
Wed.	6	4 59 47.68	10.315	22 43 49.6	14.83	1 30.79	0.459	5 1 18.47
Thur.	7	5 3 55.40	10.328	22 49 33.5	+13.83	1 19.62	0.472	5 5 15.03
Frid.	8	5 8 3.42	10.339	22 54 53.5	12.83	1 8.17	0.483	5 9 11.59
Sat.	9	5 12 11.70	10.350	22 59 49.3	11.82	0 56.45	0.494	5 13 8.15
SUN.	10	5 16 20.21	10.359	23 4 20.9	+10.81	0 44.50	0.503	5 17 4.71
Mon.	11	5 20 28.93	10.368	23 8 28.2	9.79	0 32.34	0.512	5 21 1.27
Tues.	12	5 24 37.84	10.375	23 12 11.0	8.77	0 19.98	0.519	5 24 57.82
Wed.	13	5 28 46.91	10.381	23 15 29.2	+ 7.75	0 7.47	0.525	5 28 54.38
Thur.	14	5 32 56.11	10.386	23 18 22.8	6.72	0 5.17	0.530	5 32 50.94
Frid.	15	5 37 5.41	10.390	23 20 51.8	5.69	0 17.91	0.534	5 36 47.50
Sat.	16	5 41 14.80	10.393	23 22 56.1	+ 4.66	0 30.75	0.537	5 40 44.05
SUN.	17	5 45 24.25	10.395	23 24 35.5	3.63	0 43.64	0.539	5 44 40.61
Mon.	18	5 49 33.74	10.396	23 25 50.2	2.60	0 56.57	0.540	5 48 37.17
Tues.	19	5 53 43.24	10.396	23 26 40.1	+ 1.56	1 9.51	0.540	5 52 33.73
Wed.	20	5 57 52.73	10.395	23 27 5.2	+ 0.52	1 22.44	0.539	5 56 30.28
Thur.	21	6 2 2.19	10.393	23 27 5.4	− 0.52	1 35.35	0.537	6 0 26.84
Frid.	22	6 6 11.61	10.390	23 26 40.8	− 1.55	1 48.21	0.534	6 4 23.40
Sat.	23	6 10 20.95	10.387	23 25 51.4	2.58	2 0.99	0.531	6 8 19.96
SUN.	24	6 14 30.19	10.383	23 24 37.2	3.61	2 13.67	0.527	6 12 16.51
Mon.	25	6 18 39.32	10.378	23 22 58.3	− 4.63	2 26.25	0.522	6 16 13.07
Tues.	26	6 22 48.34	10.372	23 20 54.9	5.66	2 38.72	0.516	6 20 9.62
Wed.	27	6 26 57.22	10.366	23 18 26.9	6.68	2 51.04	0.510	6 24 6.18
Thur.	28	6 31 5.94	10.359	23 15 34.3	− 7.70	3 3.20	0.503	6 28 2.74
Frid.	29	6 35 14.47	10.352	23 12 17.2	8.72	3 15.17	0.496	6 31 59.30
Sat.	30	6 39 22.79	10.343	23 8 35.8	9.73	3 26.93	0.487	6 35 55.86
SUN.	31	6 43 30.88	10.332	N. 23 4 30.1	−10.74	3 38.46	0.476	6 39 52.42

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign + prefixed to the hourly change of declination indicates that north declinations are increasing; the sign − indicates that north declinations are decreasing.

Diff. for 1 Hour, + 9s.8565. (Table III.)

AT GREENWICH MEAN NOON

Day of the Month.	Day of the Year.	THE SUN'S TRUE LONGITUDE. λ	THE SUN'S TRUE LONGITUDE. λ'	Diff. for 1 Hour.	THE SUN'S LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon
		° ′ ″	′ ″	″	″			h m s
1	153	71 21 45.2	21 39.8	143.63	− 0.58	0.0062587	+26.6	19 15 14.53
2	154	72 19 11.8	19 6.2	143.60	0.69	0.0063218	25.9	19 11 18.62
3	155	73 16 37.7	16 31.9	143.57	0.77	0.0063830	25.1	19 7 22.71
4	156	74 14 3.0	13 57.0	143.54	− 0.83	0.0064422	+24.2	19 3 26.80
5	157	75 11 27.6	11 21.5	143.51	0.86	0.0064992	23.3	18 59 30.89
6	158	76 8 51.6	8 45.4	143.48	0.86	0.0065540	22.3	18 55 34.98
7	159	77 6 14.9	6 8.5	143.46	− 0.83	0.0066064	+21.3	18 51 39.07
8	160	78 3 37.5	3 30.9	143.43	0.77	0.0066564	20.3	18 47 43.15
9	161	79 0 59.4	0 52.6	143.40	0.69	0.0067037	19.2	18 43 47.24
10	162	79 58 20.6	58 13.7	143.37	− 0.58	0.0067486	+18.2	18 39 51.33
11	163	80 55 41.0	55 34.0	143.33	0.46	0.0067910	17.2	18 35 55.42
12	164	81 53 0.6	52 53.4	143.30	0.33	0.0068309	16.2	18 31 59.50
13	165	82 50 19.4	50 12.0	143.27	− 0.20	0.0068685	+15.2	18 28 3.59
14	166	83 47 37.4	47 29.8	143.24	− 0.07	0.0069036	14.2	18 24 7.68
15	167	84 44 54.6	44 46.8	143.20	+ 0.05	0.0069364	13.3	18 20 11.77
16	168	85 42 10.9	42 3.0	143.17	+ 0.14	0.0069671	+12.4	18 16 15.86
17	169	86 39 26.4	39 18.3	143.13	0.22	0.0069958	11.6	18 12 19.95
18	170	87 36 41.2	36 32.9	143.10	0.26	0.0070226	10.8	18 8 24.04
19	171	88 33 55.3	33 46.9	143.07	+ 0.28	0.0070476	+10.1	18 4 28.13
20	172	89 31 8.8	31 0.2	143.04	0.26	0.0070710	9.4	18 0 32.22
21	173	90 28 21.6	28 12.9	143.02	0.23	0.0070928	8.8	17 56 36.31
22	174	91 25 33.9	25 25.0	143.00	+ 0.16	0.0071131	+ 8.1	17 52 40.40
23	175	92 22 45.8	22 36.7	142.99	+ 0.06	0.0071318	7.5	17 48 44.49
24	176	93 19 57.4	19 48.1	142.97	− 0.05	0.0071492	6.9	17 44 48.57
25	177	94 17 8.7	16 59.3	142.96	− 0.18	0.0071652	+ 6.3	17 40 52.66
26	178	95 14 19.9	14 10.3	142.95	0.31	0.0071797	5.7	17 36 56.75
27	179	96 11 31.0	11 21.2	142.95	0.44	0.0071927	5.1	17 33 0.84
28	180	97 8 42.1	8 32.1	142.96	− 0.56	0.0072042	+ 4.4	17 29 4.92
29	181	98 5 53.3	5 43.1	142.97	0.67	0.0072140	3.7	17 25 9.01
30	182	99 3 4.7	2 54.4	142.98	0.76	0.0072220	2.9	17 21 13.10
31	183	100 0 16.3	0 5.9	142.99	− 0.82	0.0072281	+ 2.1	17 17 17.19

NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ', to the mean equinox of January $0^d.0$.

Diff. for 1 Hour, $-9^s.8296$. (Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	15 12.5	15 6.9	55 41.9	−1.80	55 21.4	−1.61	18 46.9	1.82	21.4
2	15 2.0	14 57.6	55 3.2	1.42	54 47.3	1.23	19 29.9	1.76	22.4
3	14 53.9	14 50.8	54 33.7	1.03	54 22.5	0.83	20 11.7	1.73	23.4
4	14 48.4	14 46.7	54 13.7	−0.64	54 7.1	−0.46	20 53.3	1.74	24.4
5	14 45.4	14 44.8	54 2.6	−0.29	54 0.2	−0.12	21 35.4	1.78	25.4
6	14 44.6	14 45.0	53 59.7	+0.03	54 1.0	+0.17	22 18.8	1.84	26.4
7	14 45.8	14 47.0	54 3.9	+0.30	54 8.3	+0.43	23 4.0	1.92	27.4
8	14 48.6	14 50.5	54 14.2	0.55	54 21.4	0.65	23 51.1	2.01	28.4
9	14 52.8	14 55.4	54 29.7	0.74	54 39.1	0.83	♂		29.4
10	14 58.2	15 1.3	54 49.5	+0.91	55 0.9	+0.99	0 40.1	2.08	0.8
11	15 4.6	15 8.2	55 13.2	1.06	55 26.4	1.14	1 30.6	2.13	1.8
12	15 12.1	15 16.1	55 40.5	1.21	55 55.4	1.28	2 21.9	2.14	2.8
13	15 20.4	15 24.9	56 11.1	+1.34	56 27.6	+1.41	3 13.2	2.13	3.8
14	15 29.6	15 34.6	56 45.0	1.48	57 3.1	1.54	4 4.0	2.10	4.8
15	15 39.7	15 45.0	57 21.9	1.59	57 41.3	1.63	4 54.2	2.08	5.8
16	15 50.4	15 55.8	58 1.1	+1.66	58 21.2	+1.67	5 43.8	2.06	6.8
17	16 1.3	16 6.6	58 41.2	1.65	59 0.9	1.61	6 33.5	2.08	7.8
18	16 11.9	16 16.7	59 19.9	1.54	59 37.9	1.43	7 24.0	2.13	8.8
19	16 21.2	16 25.1	59 54.3	+1.28	60 8.6	+1.09	8 16.1	2.22	9.8
20	16 28.3	16 30.8	60 20.5	0.87	60 29.5	+0.61	9 10.7	2.34	10.8
21	16 32.3	16 32.8	60 35.1	+0.32	60 37.1	0.00	10 8 1	2.45	11.8
22	16 32.3	16 30.7	60 35.2	−0.32	60 29.4	−0.65	11 8.1	2.54	12.8
23	16 28.1	16 24.5	60 19.7	0.96	60 6.3	1.26	12 9.3	2.55	13.8
24	16 19.9	16 14.5	59 49.4	1.53	59 29.6	1.76	13 10.0	2.49	14.8
25	16 8.4	16 1.7	59 7.2	−1.95	58 42.9	−2.08	14 8.4	2.36	15.8
26	15 54.8	15 47.6	58 17.3	2.16	57 51.0	2.20	15 3.1	2.20	16.8
27	15 40.4	15 33.3	57 24.5	2.19	56 58.4	2.14	15 53.9	2.04	17.8
28	15 26.4	15 19.8	56 33.1	−2.06	56 9.0	−1.94	16 41.3	1.91	18.8
29	15 13.7	15 8.2	55 46.6	1.79	55 26.1	1.62	17 25.8	1.81	19.8
30	15 3.2	14 58.8	55 7.8	1.43	54 51.7	1.24	18 8.6	1.76	20.8
31	14 55.1	14 52.1	54 38.1	−1.03	54 27.0	−0.82	18 50.5	1.74	21.8

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	FRIDAY 1.			
	h m s	s	° ′ ″	″
0	22 54 37.42	2.0058	S. 10 28 10.5	9.904
1	22 56 37.64	2.0016	10 18 15.2	9.940
2	22 58 37.61	1.9974	10 8 17.7	9.976
3	23 0 37.32	1.9932	9 58 18.1	10.010
4	23 2 36.79	1.9891	9 48 16.5	10.044
5	23 4 36.01	1.9850	9 38 12.9	10.077
6	23 6 34.99	1.9810	9 28 7.3	10.109
7	23 8 33.73	1.9771	9 17 59.8	10.139
8	23 10 32.24	1.9732	9 7 50.6	10.168
9	23 12 30.52	1.9694	8 57 39.6	10.198
10	23 14 28.57	1.9657	8 47 26.8	10.227
11	23 16 26.40	1.9619	8 37 12.3	10.255
12	23 18 24.00	1.9582	8 26 56.2	10.282
13	23 20 21.39	1.9547	8 16 38.5	10.308
14	23 22 18.57	1.9512	8 6 19.2	10.334
15	23 24 15.54	1.9477	7 55 58.4	10.358
16	23 26 12.30	1.9442	7 45 36.2	10.382
17	23 28 8.85	1.9408	7 35 12.6	10.406
18	23 30 5.20	1.9376	7 24 47.5	10.429
19	23 32 1.36	1.9344	7 14 21.1	10.450
20	23 33 57.33	1.9313	7 3 53.5	10.471
21	23 35 53.11	1.9282	6 53 24.6	10.492
22	23 37 48.71	1.9251	6 42 54.5	10.511
23	23 39 44.12	1.9220	S. 6 32 23.3	10.530
	SATURDAY 2.			
0	23 41 39.35	1.9191	S. 6 21 50.9	10.548
1	23 43 34.41	1.9162	6 11 17.5	10.565
2	23 45 29.30	1.9134	6 0 43.1	10.582
3	23 47 24.02	1.9107	5 50 7.6	10.599
4	23 49 18.58	1.9080	5 39 31.2	10.614
5	23 51 12.98	1.9053	5 28 53.9	10.629
6	23 53 7.22	1.9027	5 18 15.7	10.643
7	23 55 1.31	1.9002	5 7 36.7	10.657
8	23 56 55.25	1.8977	4 56 56.9	10.669
9	23 58 49.04	1.8953	4 46 16.4	10.681
10	0 0 42.69	1.8930	4 35 35.2	10.692
11	0 2 36.20	1.8907	4 24 53.3	10.703
12	0 4 29.57	1.8884	4 14 10.8	10.713
13	0 6 22.81	1.8863	4 3 27.7	10.723
14	0 8 15.93	1.8842	3 52 44.1	10.732
15	0 10 8.92	1.8822	3 41 59.9	10.740
16	0 12 1.79	1.8802	3 31 15.3	10.748
17	0 13 54.54	1.8782	3 20 30.2	10.755
18	0 15 47.18	1.8764	3 9 44.7	10.761
19	0 17 39.71	1.8746	2 58 58.9	10.766
20	0 19 32.13	1.8728	2 48 12.8	10.771
21	0 21 24.45	1.8711	2 37 26.4	10.775
22	0 23 16.67	1.8695	2 26 39.8	10.779
23	0 25 8.79	1.8679	2 15 52.9	10.783
24	0 27 0.81	1.8663	S. 2 5 5.8	10.786

Hour.	Right Ascension	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SUNDAY 3.			
	h m s	s	° ′ ″	″
0	0 27 0.81	1.8663	S. 2 5 5.8	10.786
1	0 28 52.75	1.8649	1 54 18.6	10.787
2	0 30 44.60	1.8635	1 43 31.3	10.788
3	0 32 36.37	1.8622	1 32 44.0	10.789
4	0 34 28.06	1.8609	1 21 56.6	10.789
5	0 36 19.67	1.8596	1 11 9.3	10.788
6	0 38 11.21	1.8584	1 0 22.0	10.787
7	0 40 2.68	1.8573	0 49 34.8	10.786
8	0 41 54.09	1.8563	0 38 47.7	10.784
9	0 43 45.44	1.8553	0 28 0.7	10.782
10	0 45 36.73	1.8543	0 17 13.9	10.778
11	0 47 27.96	1.8534	S. 0 6 27.4	10.773
12	0 49 19.14	1.8526	N. 0 4 18.9	10.769
13	0 51 10.28	1.8519	0 15 4.9	10.764
14	0 53 1.37	1.8511	0 25 50.6	10.758
15	0 54 52.41	1.8504	0 36 35.9	10.752
16	0 56 43.41	1.8497	0 47 20.8	10.745
17	0 58 34.38	1.8492	0 58 5.3	10.737
18	1 0 25.32	1.8487	1 8 49.3	10.729
19	1 2 16.23	1.8483	1 19 32.8	10.721
20	1 4 7.12	1.8479	1 30 15.8	10.712
21	1 5 57.98	1.8476	1 40 58.2	10.702
22	1 7 48.83	1.8473	1 51 40.0	10.691
23	1 9 39.66	1.8471	N. 2 2 21.1	10.680
	MONDAY 4.			
0	1 11 30.48	1.8469	N. 2 13 1.6	10.669
1	1 13 21.29	1.8468	2 23 41.4	10.656
2	1 15 12.10	1.8467	2 34 20.4	10.643
3	1 17 2.90	1.8467	2 44 58.6	10.630
4	1 18 53.70	1.8467	2 55 36.0	10.617
5	1 20 44.51	1.8468	3 6 12.6	10.603
6	1 22 35.32	1.8470	3 16 48.3	10.588
7	1 24 26.15	1.8472	3 27 23.1	10.572
8	1 26 16.99	1.8474	3 37 56.9	10.555
9	1 28 7.84	1.8477	3 48 29.7	10.539
10	1 29 58.71	1.8481	3 59 1.5	10.522
11	1 31 49.61	1.8485	4 9 32.3	10.504
12	1 33 40.53	1.8489	4 20 2.0	10.485
13	1 35 31.48	1.8494	4 30 30.5	10.465
14	1 37 22.46	1.8500	4 40 57.8	10.446
15	1 39 13.48	1.8507	4 51 24.0	10.426
16	1 41 4.54	1.8513	5 1 48.9	10.405
17	1 42 55.64	1.8520	5 12 12.6	10.384
18	1 44 46.78	1.8527	5 22 35.0	10.362
19	1 46 37.96	1.8535	5 32 56.0	10.339
20	1 48 29.20	1.8544	5 43 15 7	10.316
21	1 50 20.49	1.8553	5 53 34.0	10.292
22	1 52 11.83	1.8562	6 3 50.8	10.267
23	1 54 3.23	1.8572	6 14 6.1	10.243
24	1 55 54.70	1.8583	N. 6 24 20.0	10.218

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

TUESDAY 5.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute
	h m s	s	° ′ ″	″
0	1 55 54.70	1.8583	N. 6 24 20.0	10.218
1	1 57 46.23	1.8594	6 34 32.3	10.192
2	1 59 37.83	1.8605	6 44 43.0	10.165
3	2 1 29.49	1.8617	6 54 52.1	10.137
4	2 3 21.23	1.8629	7 4 59.5	10.109
5	2 5 13.04	1.8642	7 15 5.2	10.081
6	2 7 4.93	1.8655	7 25 9.3	10.053
7	2 8 56.90	1.8668	7 35 11.6	10.023
8	2 10 48.95	1.8682	7 45 12.1	9.992
9	2 12 41.09	1.8697	7 55 10.7	9.961
10	2 14 33.32	1.8712	8 5 7.4	9.930
11	2 16 25.64	1.8727	8 15 2.3	9.899
12	2 18 18.05	1.8743	8 24 55.3	9.867
13	2 20 10.56	1.8760	8 34 46.3	9.833
14	2 22 3.17	1.8776	8 44 35.2	9.798
15	2 23 55.87	1.8793	8 54 22.1	9.764
16	2 25 48.68	1.8811	9 4 6.9	9.729
17	2 27 41.60	1.8829	9 13 49.6	9.693
18	2 29 34.63	1.8847	9 23 30.1	9.657
19	2 31 27.77	1.8866	9 33 8.5	9.621
20	2 33 21.02	1.8885	9 42 44.6	9.583
21	2 35 14.39	1.8904	9 52 18.4	9.544
22	2 37 7.87	1.8924	10 1 49.9	9.505
23	2 39 1.48	1.8945	N 10 11 19.0	9.466

WEDNESDAY 6.

0	2 40 55.21	1.8966	N.10 20 45.8	9.427
1	2 42 49.07	1.8987	10 30 10.2	9.386
2	2 44 43.05	1.9008	10 39 32.1	9.344
3	2 46 37.16	1.9030	10 48 51.4	9.301
4	2 48 31.41	1.9052	10 58 8.2	9.259
5	2 50 25.79	1.9074	11 7 22.5	9.216
6	2 52 20.30	1.9097	11 16 34.2	9.173
7	2 54 14.95	1.9120	11 25 43.3	9.128
8	2 56 9.74	1.9144	11 34 49.6	9.083
9	2 58 4.68	1.9168	11 43 53.2	9.037
10	2 59 59.76	1.9192	11 52 54.0	8.990
11	3 1 54.99	1.9217	12 1 52.0	8.943
12	3 3 50.36	1.9241	12 10 47.2	8.896
13	3 5 45.88	1.9266	12 19 39.5	8.847
14	3 7 41.56	1.9292	12 28 28.9	8.798
15	3 9 37.39	1.9317	12 37 15.3	8.748
16	3 11 33.37	1.9343	12 45 58.7	8.697
17	3 13 29.51	1.9370	12 54 39.0	8.647
18	3 15 25.81	1.9397	13 3 16.3	8.596
19	3 17 22.27	1.9423	13 11 50.5	8.543
20	3 19 18.89	1.9450	13 20 21.5	8.489
21	3 21 15.67	1.9478	13 28 49.2	8.435
22	3 23 12.62	1.9506	13 37 13.7	8.382
23	3 25 9.74	1.9533	13 45 35.0	8.328
24	3 27 7.02	1.9561	N.13 53 53.0	8.272

THURSDAY 7.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	3 27 7.02	1.9561	N.13 53 53.0	8.272
1	3 29 4.47	1.9589	14 2 7.6	8.215
2	3 31 2.09	1.9618	14 10 18.8	8.157
3	3 32 59.89	1.9647	14 18 26.5	8.100
4	3 34 57.86	1.9676	14 26 30.8	8.042
5	3 36 56.00	1.9705	14 34 31.5	7.983
6	3 38 54.32	1.9735	14 42 28.7	7.923
7	3 40 52.82	1.9764	14 50 22.3	7.862
8	3 42 51.49	1.9793	14 58 12.2	7.801
9	3 44 50.34	1.9823	15 5 58.4	7.739
10	3 46 49.37	1.9853	15 13 40.9	7.677
11	3 48 48.58	1.9884	15 21 19.7	7.615
12	3 50 47.98	1.9915	15 28 54.7	7.551
13	3 52 47.56	1.9945	15 36 25.8	7.487
14	3 54 47.32	1.9976	15 43 53.1	7.422
15	3 56 47.27	2.0007	15 51 16.4	7.355
16	3 58 47.40	2.0038	15 58 35.7	7.289
17	4 0 47.72	2.0069	16 5 51.0	7.222
18	4 2 48.23	2.0101	16 13 2.3	7.154
19	4 4 48.93	2.0132	16 20 9.5	7.085
20	4 6 49.81	2.0163	16 27 12.5	7.016
21	4 8 50.88	2.0194	16 34 11.4	6.947
22	4 10 52.14	2.0226	16 41 6.1	6.876
23	4 12 53.59	2.0257	N.16 47 56.5	6.805

FRIDAY 8.

0	4 14 55.22	2.0288	N.16 54 42.7	6.733
1	4 16 57.04	2.0320	17 1 24.5	6.660
2	4 18 59.06	2.0352	17 8 1.9	6.587
3	4 21 1.27	2.0384	17 14 35.0	6.514
4	4 23 3.67	2.0416	17 21 3.6	6.439
5	4 25 6.26	2.0447	17 27 27.7	6.363
6	4 27 9.04	2.0479	17 33 47.2	6.287
7	4 29 12.01	2.0512	17 40 2.1	6.211
8	4 31 15.18	2.0544	17 46 12.5	6.135
9	4 33 18.54	2.0575	17 52 18.3	6.057
10	4 35 22.08	2.0606	17 58 19.4	5.978
11	4 37 25.81	2.0637	18 4 15.7	5.898
12	4 39 29.73	2.0669	18 10 7.2	5.818
13	4 41 33.84	2.0701	18 15 53.9	5.738
14	4 43 38.14	2.0732	18 21 35.8	5.657
15	4 45 42.63	2.0764	18 27 12.8	5.576
16	4 47 47.31	2.0796	18 32 44.9	5.494
17	4 49 52.18	2.0827	18 38 12.0	5.411
18	4 51 57.23	2.0858	18 43 34.2	5.327
19	4 54 2.47	2.0889	18 48 51.3	5.242
20	4 56 7.90	2.0920	18 54 3.3	5.157
21	4 58 13.51	2.0950	18 59 10.2	5.072
22	5 0 19.30	2.0981	19 4 12.0	4.986
23	5 2 25.28	2.1012	19 9 8.6	4.899
24	5 4 31.44	2.1042	N.19 13 59.9	4.812

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SATURDAY 9.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute
	h m s	s	° ′ ″	″
0	5 4 31.44	2.1042	N.19 13 59.9	4.812
1	5 6 37.78	2.1072	19 18 46.0	4.724
2	5 8 44.30	2.1102	19 23 26.8	4.636
3	5 10 51.00	2.1132	19 28 2.3	4.547
4	5 12 57.88	2.1162	19 32 32.4	4.457
5	5 15 4.94	2.1191	19 36 57.1	4.367
6	5 17 12.17	2.1219	19 41 16.4	4.276
7	5 19 19.57	2.1248	19 45 30.2	4.184
8	5 21 27.15	2.1277	19 49 38.5	4.092
9	5 23 34.90	2.1306	19 53 41.2	3.999
10	5 25 42.82	2.1334	19 57 38.4	3.906
11	5 27 50.90	2.1361	20 1 30.0	3.813
12	5 29 59.15	2.1389	20 5 16.0	3.719
13	5 32 7.57	2.1417	20 8 56.3	3.624
14	5 34 16.15	2.1444	20 12 30.9	3.529
15	5 36 24.89	2.1470	20 15 59.8	3.433
16	5 38 33.79	2.1497	20 19 22.9	3.337
17	5 40 42.85	2.1523	20 22 40.2	3.240
18	5 42 52.07	2.1549	20 25 51.7	3.142
19	5 45 1.44	2.1574	20 28 57.3	3.045
20	5 47 10.96	2.1599	20 31 57.1	2.947
21	5 49 20.63	2.1624	20 34 51.0	2.848
22	5 51 30.45	2.1649	20 37 38.9	2.748
23	5 53 40.42	2.1673	N.20 40 20.8	2.649

SUNDAY 10.

0	5 55 50.53	2.1697	N.20 42 56.8	2.550
1	5 58 0.78	2.1720	20 45 26.8	2.449
2	6 0 11.17	2.1743	20 47 50.7	2.347
3	6 2 21.70	2.1766	20 50 8.5	2.246
4	6 4 32.36	2.1789	20 52 20.2	2.144
5	6 6 43.16	2.1811	20 54 25.8	2.042
6	6 8 54.09	2.1832	20 56 25.3	1.940
7	6 11 5.14	2.1852	20 58 18.6	1.837
8	6 13 16.32	2.1873	21 0 5.7	1.733
9	6 15 27.62	2.1893	21 1 46.6	1.630
10	6 17 39.04	2.1913	21 3 21.3	1.526
11	6 19 50.58	2.1933	21 4 49.7	1.422
12	6 22 2.24	2.1952	21 6 11.9	1.317
13	6 24 14.01	2.1971	21 7 27.8	1.212
14	6 26 25.89	2.1989	21 8 37.3	1.106
15	6 28 37.87	2.2006	21 9 40.5	1.000
16	6 30 49.96	2.2023	21 10 37.3	0.894
17	6 33 2.15	2.2040	21 11 27.8	0.788
18	6 35 14.44	2.2057	21 12 11.9	0.682
19	6 37 26.83	2.2073	21 12 49.6	0.575
20	6 39 39.31	2.2088	21 13 20.9	0.467
21	6 41 51.88	2.2103	21 13 45.7	0.360
22	6 44 4.54	2.2117	21 14 4.1	0.252
23	6 46 17.28	2.2131	21 14 16.0	0.145
24	6 48 30.11	2.2144	N.21 14 21.5	+ 0.037

MONDAY 11.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	6 48 30.11	2.2144	N.21 14 21.5	+ 0.037
1	6 50 43.01	2.2157	21 14 20.5	− 0.071
2	6 52 55.99	2.2170	21 14 13.0	0.179
3	6 55 9.05	2.2182	21 13 59.0	0.288
4	6 57 22.18	2.2193	21 13 38.4	0.397
5	6 59 35.37	2.2204	21 13 11.3	0.506
6	7 1 48.63	2.2215	21 12 37.7	0.615
7	7 4 1.95	2.2225	21 11 57.5	0.724
8	7 6 15.33	2.2235	21 11 10.8	0.833
9	7 8 28.77	2.2244	21 10 17.6	0.942
10	7 10 42.26	2.2252	21 9 17.8	1.052
11	7 12 55.80	2.2260	21 8 11.4	1.161
12	7 15 9.38	2.2267	21 6 58.5	1.270
13	7 17 23.01	2.2275	21 5 39.0	1.380
14	7 19 36.68	2.2282	21 4 12.9	1.490
15	7 21 50.39	2.2288	21 2 40.2	1.600
16	7 24 4.14	2.2294	21 1 0.9	1.710
17	7 26 17.92	2.2299	20 59 15.0	1.819
18	7 28 31.73	2.2304	20 57 22.6	1.928
19	7 30 45.57	2.2308	20 55 23.6	2.038
20	7 32 59.43	2.2312	20 53 18.0	2.148
21	7 35 13.31	2.2315	20 51 5.8	2.257
22	7 37 27.21	2.2318	20 48 47.1	2.367
23	7 39 41.13	2.2321	N.20 46 21.8	2.477

TUESDAY 12.

0	7 41 55.07	2.2324	N.20 43 49.9	2.586
1	7 44 9.02	2.2325	20 41 11.5	2.695
2	7 46 22.97	2.2325	20 38 26.5	2.805
3	7 48 36.92	2.2326	20 35 34.9	2.914
4	7 50 50.88	2.2327	20 32 36.8	3.023
5	7 53 4.84	2.2327	20 29 32.1	3.132
6	7 55 18.80	2.2326	20 26 20.9	3.241
7	7 57 32.75	2.2324	20 23 3.2	3.349
8	7 59 46.69	2.2323	20 19 39.0	3.457
9	8 2 0.63	2.2322	20 16 8.3	3.566
10	8 4 14.56	2.2320	20 12 31.1	3.674
11	8 6 28.47	2.2317	20 8 47.4	3.782
12	8 8 42.36	2.2313	20 4 57.2	3.890
13	8 10 56.23	2.2310	20 1 0.6	3.997
14	8 13 10.08	2.2307	19 56 57.6	4.104
15	8 15 23.91	2.2303	19 52 48.1	4.211
16	8 17 37.71	2.2298	19 48 32.2	4.318
17	8 19 51.49	2.2294	19 44 9.9	4.424
18	8 22 5.24	2.2289	19 39 41.3	4.530
19	8 24 18.96	2.2283	19 35 6.3	4.636
20	8 26 32.64	2.2277	19 30 25.0	4.742
21	8 28 46.28	2.2270	19 25 37.3	4.847
22	8 30 59.88	2.2264	19 20 43.3	4.952
23	8 33 13.45	2.2258	19 15 43.1	5.056
24	8 35 26.98	2.2251	N.19 10 36.6	5.160

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute	Declination.	Diff. for 1 Minute.
	WEDNESDAY 13.			
	h m s	s	° ′ ″	″
0	8 35 26.98	2.2251	N.19 10 36.6	5.160
1	8 37 40.46	2.2243	19 5 23.9	5.264
2	8 39 53.90	2.2236	19 0 4.9	5.368
3	8 42 7.29	2.2228	18 54 39.7	5.472
4	8 44 20.63	2.2219	18 49 8.3	5.574
5	8 46 33.92	2.2211	18 43 30.8	5.676
6	8 48 47.16	2.2202	18 37 47.2	5.777
7	8 51 0.35	2.2193	18 31 57.5	5.879
8	8 53 13.48	2.2184	18 26 1.7	5.981
9	8 55 26.56	2.2175	18 19 59.8	6.082
10	8 57 39.58	2.2166	18 13 51.9	6.182
11	8 59 52.55	2.2157	18 7 38.0	6.282
12	9 2 5.46	2.2147	18 1 18.1	6.381
13	9 4 18.31	2.2137	17 54 52.3	6.479
14	9 6 31.10	2.2126	17 48 20.6	6.578
15	9 8 43.82	2.2115	17 41 42.9	6.676
16	9 10 56.48	2.2105	17 34 59.4	6.773
17	9 13 9.08	2.2094	17 28 10.1	6.870
18	9 15 21.61	2.2083	17 21 15.0	6.967
19	9 17 34.08	2.2072	17 14 14.1	7.062
20	9 19 46.48	2.2062	17 7 7.5	7.157
21	9 21 58.82	2.2051	16 59 55.2	7.252
22	9 24 11.09	2.2039	16 52 37.2	7.347
23	9 26 23.29	2.2028	N.16 45 13.6	7.441
	THURSDAY 14.			
0	9 28 35.43	2.2017	N.16 37 44.3	7.534
1	9 30 47.50	2.2006	16 30 9.5	7.626
2	9 32 59.50	2.1994	16 22 29.2	7.717
3	9 35 11.43	2.1983	16 14 43.4	7.809
4	9 37 23 29	2.1972	16 6 52.1	7.901
5	9 39 35.09	2.1961	15 58 55.3	7.992
6	9 41 46.82	2.1949	15 50 53.1	8.081
7	9 43 58.48	2.1938	15 42 45.6	8.169
8	9 46 10.07	2.1927	15 34 32.8	8.258
9	9 48 21.60	2.1916	15 26 14.7	8.346
10	9 50 33.06	2.1904	15 17 51.3	8.433
11	9 52 44.45	2.1893	15 9 22.8	8.519
12	9 54 55.77	2.1882	15 0 49.1	8.605
13	9 57 7.03	2.1871	14 52 10.2	8.690
14	9 59 18.22	2.1859	14 43 26.3	8.774
15	10 1 29.34	2.1848	14 34 37.3	8.858
16	10 3 40.40	2.1838	14 25 43.3	8.941
17	10 5 51.40	2.1827	14 16 44.4	9.024
18	10 8 2.33	2.1817	14 7 40.5	9.106
19	10 10 13.20	2.1807	13 58 31.7	9.187
20	10 12 24.01	2.1796	13 49 18.1	9.267
21	10 14 34.75	2.1786	13 39 59.7	9.347
22	10 16 45.44	2.1777	13 30 36.5	9.425
23	10 18 56.07	2.1767	13 21 8.7	9.503
24	10 21 6.64	2.1757	N.13 11 36.2	9.581

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	FRIDAY 15.			
	h m s	s	° ′ ″	″
0	10 21 6.64	2.1757	N.13 11 36.2	9.581
1	10 23 17.16	2.1748	13 1 59.0	9.657
2	10 25 27.62	2.1738	12 52 17.3	9.733
3	10 27 38.02	2.1729	12 42 31.0	9.809
4	10 29 48.37	2.1721	12 32 40.2	9.883
5	10 31 58.67	2.1712	12 22 45.0	9.957
6	10 34 8.92	2.1704	12 12 45.4	10.030
7	10 36 19.12	2.1696	12 2 41.4	10.102
8	10 38 29.27	2.1688	11 52 33.1	10.173
9	10 40 39.38	2.1681	11 42 20.6	10.244
10	10 42 49.45	2.1674	11 32 3.8	10.314
11	10 44 59.47	2.1667	11 21 42.9	10.383
12	10 47 9.45	2.1660	11 11 17.9	10.451
13	10 49 19.39	2.1654	11 0 48.8	10.519
14	10 51 29.30	2.1648	10 50 15.6	10.586
15	10 53 39.17	2.1642	10 39 38.5	10.651
16	10 55 49.01	2.1637	10 28 57.5	10.716
17	10 57 58.82	2.1632	10 18 12.6	10.780
18	11 0 8.59	2.1627	10 7 23.9	10.843
19	11 2 18.34	2.1623	9 56 31.4	10.906
20	11 4 28.07	2.1619	9 45 35.2	10.967
21	11 6 37.77	2.1615	9 34 35.3	11.028
22	11 8 47.45	2.1612	9 23 31.8	11.088
23	11 10 57.12	2.1610	N. 9 12 24.7	11.147
	SATURDAY 16.			
0	11 13 6.77	2.1608	N. 9 1 14.1	11.206
1	11 15 16.41	2.1606	8 50 0.0	11.263
2	11 17 26.04	2.1604	8 38 42.5	11.319
3	11 19 35.66	2.1602	8 27 21.7	11.374
4	11 21 45.27	2.1601	8 15 57.6	11.429
5	11 23 54.87	2.1600	8 4 30.2	11.482
6	11 26 4.47	2.1600	7 52 59.7	11.535
7	11 28 14.07	2.1601	7 41 26.0	11.587
8	11 30 23.68	2.1602	7 29 49.2	11.638
9	11 32 33.30	2.1604	7 18 9.4	11.688
10	11 34 42.93	2.1606	7 6 26.6	11.737
11	11 36 52.57	2.1608	6 54 40.9	11.785
12	11 39 2.22	2.1610	6 42 52.4	11.832
13	11 41 11.89	2.1613	6 31 1.1	11.878
14	11 43 21.58	2.1617	6 19 7.0	11.924
15	11 45 31.30	2.1622	6 7 10.2	11.968
16	11 47 41.04	2.1626	5 55 10.8	12.012
17	11 49 50.81	2.1631	5 43 8.8	12.054
18	11 52 0.61	2.1637	5 31 4.3	12.095
19	11 54 10.45	2.1643	5 18 57.4	12.136
20	11 56 20.33	2.1649	5 6 48.0	12.176
21	11 58 30.24	2.1656	4 54 36.3	12.213
22	12 0 40.20	2.1664	4 42 22.4	12.250
23	12 2 50.21	2.1672	4 30 6.3	12.287
24	12 5 0.27	2.1681	N. 4 17 48.0	12.323

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SUNDAY 17.			
	h m s	s	° ′ ″	″
0	12 5 0.27	2.1681	N. 4 17 48.0	12.323
1	12 7 10.38	2.1690	4 5 27.6	12.357
2	12 9 20.55	2.1706	3 53 5.2	12.389
3	12 11 30.78	2.1710	3 40 40.9	12.421
4	12 13 41.07	2.1721	3 28 14.7	12.452
5	12 15 51.43	2.1732	3 15 46.6	12.482
6	12 18 1.86	2.1744	3 3 16.8	12.511
7	12 20 12.36	2.1757	2 50 45.3	12.539
8	12 22 22.94	2.1770	2 38 12.1	12.566
9	12 24 33.60	2.1783	2 25 37.4	12.591
10	12 26 44.34	2.1797	2 13 1.2	12.616
11	12 28 55.16	2.1811	2 0 23.5	12.639
12	12 31 6.07	2.1826	1 47 44.5	12.661
13	12 33 17.08	2.1842	1 35 4.2	12.682
14	12 35 28.18	2.1858	1 22 22.6	12.702
15	12 37 39.38	2.1875	1 9 39.9	12.721
16	12 39 50.68	2.1893	0 56 56.1	12.739
17	12 42 2.09	2.1911	0 44 11.2	12.756
18	12 44 13.61	2.1929	0 31 25.4	12.771
19	12 46 25.24	2.1948	0 18 38.7	12.785
20	12 48 36.99	2.1968	N. 0 5 51.2	12.797
21	12 50 48.86	2.1988	S. 0 6 57.0	12.809
22	12 53 0.85	2.2008	0 19 45.9	12.820
23	12 55 12.96	2.2029	S. 0 32 35.4	12.829
	MONDAY 18.			
0	12 57 25.20	2.2051	S. 0 45 25.4	12.837
1	12 59 37.58	2.2074	0 58 15.9	12.844
2	13 1 50.09	2.2097	1 11 6.7	12.849
3	13 4 2.74	2.2121	1 23 57.8	12.854
4	13 6 15.54	2.2145	1 36 49.2	12.857
5	13 8 28.48	2.2169	1 49 40.7	12.859
6	13 10 41.57	2.2195	2 2 32.3	12.860
7	13 12 54.82	2.2221	2 15 23.9	12.859
8	13 15 8.22	2.2247	2 28 15.4	12.857
9	13 17 21.78	2.2273	2 41 6.8	12.854
10	13 19 35.50	2.2301	2 53 57.9	12.849
11	13 21 49.39	2.2329	3 6 48.7	12.843
12	13 24 3.45	2.2357	3 19 39.1	12.836
13	13 26 17.68	2.2387	3 32 29.0	12.827
14	13 28 32.09	2.2417	3 45 18.4	12.818
15	13 30 46.68	2.2447	3 58 7.2	12.807
16	13 33 1.45	2.2477	4 10 55.2	12.794
17	13 35 16.40	2.2507	4 23 42.4	12.780
18	13 37 31.54	2.2539	4 36 28.8	12.765
19	13 39 46.87	2.2571	4 49 14.2	12.748
20	13 42 2.40	2.2604	5 1 58.6	12.730
21	13 44 18.12	2.2638	5 14 41.8	12.709
22	13 46 34.05	2.2672	5 27 23.7	12.688
23	13 48 50.18	2.2705	5 40 4.3	12.666
24	13 51 6.51	2.2739	S. 5 52 43.6	12.642

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	TUESDAY 19.			
	h m s	s	° ′ ″	″
0	13 51 6.51	2.2739	S. 5 52 43.6	12.642
1	13 53 23.05	2.2775	6 5 21.4	12.617
2	13 55 39.81	2.2811	6 17 57.7	12.591
3	13 57 56.78	2.2847	6 30 32.3	12.562
4	14 0 13.97	2.2883	6 43 5.2	12.532
5	14 2 31.38	2.2920	6 55 36.2	12.501
6	14 4 49.01	2.2957	7 8 5.3	12.468
7	14 7 6.87	2.2995	7 20 32.4	12.434
8	14 9 24.95	2.3033	7 32 57.4	12.399
9	14 11 43.26	2.3072	7 45 20.3	12.362
10	14 14 1.81	2.3111	7 57 40.9	12.324
11	14 16 20.59	2.3150	8 9 59.2	12.284
12	14 18 39.61	2.3190	8 22 15.0	12.242
13	14 20 58.87	2.3230	8 34 28.3	12.200
14	14 23 18.37	2.3271	8 46 39.0	12.155
15	14 25 38.12	2.3312	8 58 46.9	12.108
16	14 27 58.11	2.3353	9 10 52.0	12.061
17	14 30 18.35	2.3394	9 22 54.2	12.012
18	14 32 38.84	2.3436	9 34 53.4	11.961
19	14 34 59.58	2.3478	9 46 49.5	11.909
20	14 37 20.57	2.3520	9 58 42.5	11.856
21	14 39 41.82	2.3563	10 10 32.2	11.800
22	14 42 3.33	2.3606	10 22 18.5	11.743
23	14 44 25.10	2.3649	S. 10 34 1.4	11.685
	WEDNESDAY 20.			
0	14 46 47.12	2.3692	S. 10 45 40.7	11.625
1	14 49 9.40	2.3736	10 57 16.4	11.563
2	14 51 31.95	2.3781	11 8 48.3	11.500
3	14 53 54.77	2.3825	11 20 16.4	11.435
4	14 56 17.85	2.3868	11 31 40.5	11.368
5	14 58 41.19	2.3912	11 43 0.6	11.301
6	15 1 4.79	2.3956	11 54 16.6	11.232
7	15 3 28.66	2.4001	12 5 28.4	11.161
8	15 5 52.80	2.4046	12 16 35.9	11.087
9	15 8 17.21	2.4091	12 27 38.9	11.012
10	15 10 41.89	2.4136	12 38 37.4	10.937
11	15 13 6.84	2.4180	12 49 31.4	10.861
12	15 15 32.05	2.4224	13 0 20.7	10.782
13	15 17 57.53	2.4269	13 11 5.2	10.701
14	15 20 23.28	2.4315	13 21 44.8	10.619
15	15 22 49.31	2.4361	13 32 19.5	10.536
16	15 25 15.61	2.4405	13 42 49.1	10.450
17	15 27 42.17	2.4449	13 53 13.5	10.363
18	15 30 9.00	2.4494	14 3 32.7	10.275
19	15 32 36.10	2.4538	14 13 46.5	10.185
20	15 35 3.46	2.4582	14 23 54.9	10.094
21	15 37 31.09	2.4627	14 33 57.8	10.002
22	15 39 58.98	2.4671	14 43 55.1	9.907
23	15 42 27.14	2.4715	14 53 46.6	9.810
24	15 44 55.56	2.4758	S. 15 3 32.3	9.712

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	THURSDAY 21.			
	h m s	s	° ′ ″	″
0	15 44 55.56	2.4758	S. 15 3 32.3	9.712
1	15 47 24.24	2.4802	15 13 12.1	9.614
2	15 49 53.18	2.4845	15 22 46.0	9.514
3	15 52 22.38	2.4888	15 32 13.8	9.412
4	15 54 51.84	2.4931	15 41 35.5	9.309
5	15 57 21.55	2.4973	15 50 50.9	9.204
6	15 59 51.51	2.5014	16 0 0.0	9.097
7	16 2 21.72	2.5056	16 9 2.6	8.990
8	16 4 52.18	2.5097	16 17 58.8	8.882
9	16 7 22.88	2.5138	16 26 48.4	8.771
10	16 9 53.83	2.5178	16 35 31.3	8.658
11	16 12 25.02	2.5217	16 44 7.4	8.545
12	16 14 56.44	2.5257	16 52 36.7	8.431
13	16 17 28.10	2.5296	17 0 59.1	8.315
14	16 19 59.99	2.5334	17 9 14.5	8.197
15	16 22 32.10	2.5371	17 17 22.8	8.079
16	16 25 4.44	2.5408	17 25 24.0	7.959
17	16 27 37.00	2.5445	17 33 17.9	7.837
18	16 30 9.78	2.5481	17 41 4.5	7.715
19	16 32 42.77	2.5516	17 48 43.7	7.592
20	16 35 15.97	2.5550	17 56 15.5	7.467
21	16 37 49.37	2.5583	18 3 39.7	7.341
22	16 40 22.97	2.5616	18 10 56.4	7.214
23	16 42 56.77	2.5649	S. 18 18 5.4	7.085
	FRIDAY 22.			
0	16 45 30.76	2.5681	S. 18 25 6.6	6.955
1	16 48 4.94	2.5712	18 32 0.0	6.825
2	16 50 39.30	2.5741	18 38 45.6	6.693
3	16 53 13.83	2.5770	18 45 23.2	6.560
4	16 55 48.54	2.5799	18 51 52.8	6.427
5	16 58 23.42	2.5827	18 58 14.4	6.292
6	17 0 58.46	2.5853	19 4 27.8	6.155
7	17 3 33.65	2.5878	19 10 33.0	6.018
8	17 6 8.99	2.5903	19 16 30.0	5.881
9	17 8 44.48	2.5927	19 22 18.8	5.743
10	17 11 20.11	2.5949	19 27 59.2	5.603
11	17 13 55.87	2.5971	19 33 31.2	5.462
12	17 16 31.76	2.5992	19 38 54.7	5.321
13	17 19 7.77	2.6011	19 44 9.7	5.179
14	17 21 43.89	2.6029	19 49 16.2	5.037
15	17 24 20.12	2.6047	19 54 14.2	4.894
16	17 26 56.45	2.6063	19 59 3.5	4.749
17	17 29 32.88	2.6079	20 3 44.1	4.604
18	17 32 9.40	2.6093	20 8 16.0	4.459
19	17 34 46.00	2.6106	20 12 39.2	4.313
20	17 37 22.67	2.6117	20 16 53.6	4.166
21	17 39 59.41	2.6128	20 20 59.2	4.019
22	17 42 36.21	2.6138	20 24 55.9	3.872
23	17 45 13.07	2.6147	20 28 43.8	3.724
24	17 47 49.98	2.6155	S. 20 32 22.8	3.576

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY 23.			
	h m s	s	° ′ ″	″
0	17 47 49.98	2.6155	S. 20 32 22.8	3.576
1	17 50 26.93	2.6161	20 35 52.9	3.427
2	17 53 3.91	2.6165	20 39 14.0	3.277
3	17 55 40.91	2.6168	20 42 26.1	3.127
4	17 58 17.93	2.6171	20 45 29.2	2.977
5	18 0 54.96	2.6172	20 48 23.3	2.827
6	18 3 32.00	2.6172	20 51 8.4	2.676
7	18 6 9.03	2.6171	20 53 44.4	2.525
8	18 8 46.05	2.6169	20 56 11.4	2.375
9	18 11 23.06	2.6166	20 58 29.4	2.224
10	18 14 0.04	2.6161	21 0 38.3	2.073
11	18 16 36.99	2.6154	21 2 38.1	1.922
12	18 19 13.89	2.6146	21 4 28.9	1.771
13	18 21 50.74	2.6137	21 6 10.6	1.619
14	18 24 27.54	2.6128	21 7 43.2	1.468
15	18 27 4.28	2.6117	21 9 6.8	1.317
16	18 29 40.94	2.6104	21 10 21.3	1.167
17	18 32 17.52	2.6090	21 11 26.8	1.016
18	18 34 54.02	2.6075	21 12 23.2	0.865
19	18 37 30.42	2.6058	21 13 10.6	0.715
20	18 40 6.72	2.6041	21 13 49.0	0.565
21	18 42 42.92	2.6023	21 14 18.4	0.415
22	18 45 19.00	2.6003	21 14 38.8	0.265
23	18 47 54.96	2.5982	S. 21 14 50.2	−0.115
	SUNDAY 24.			
0	18 50 30.79	2.5960	S. 21 14 52.6	+0.034
1	18 53 6.48	2.5937	21 14 46.1	0.182
2	18 55 42.03	2.5912	21 14 30.8	0.329
3	18 58 17.42	2.5885	21 14 6.6	0.477
4	19 0 52.65	2.5858	21 13 33.5	0.625
5	19 3 27.72	2.5830	21 12 51.6	0.771
6	19 6 2.61	2.5800	21 12 1.0	0.917
7	19 8 37.32	2.5770	21 11 1.6	1.062
8	19 11 11.85	2.5739	21 9 53.5	1.207
9	19 13 46.19	2.5707	21 8 36.7	1.352
10	19 16 20.33	2.5673	21 7 11.3	1.495
11	19 18 54.26	2.5638	21 5 37.3	1.638
12	19 21 27.98	2.5602	21 3 54.7	1.781
13	19 24 1.48	2.5565	21 2 3.6	1.922
14	19 26 34.76	2.5527	21 0 4.1	2.063
15	19 29 7.80	2.5488	20 57 56.1	2.203
16	19 31 40.61	2.5448	20 55 39.7	2.342
17	19 34 13.18	2.5407	20 53 15.0	2.480
18	19 36 45.50	2.5365	20 50 42.1	2.618
19	19 39 17.56	2.5322	20 48 0.9	2.755
20	19 41 49.36	2.5278	20 45 11.5	2.890
21	19 44 20.90	2.5234	20 42 14.1	3.024
22	19 46 52.17	2.5189	20 39 8.6	3.158
23	19 49 23.17	2.5143	20 35 55.1	3.292
24	19 51 53.89	2.5096	S. 20 32 33.6	3.424

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

MONDAY 25.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	19 51 53.89	2.5096	S. 20 32 33.6	3.424
1	19 54 24.32	2.5047	20 29 4.2	3.554
2	19 56 54.46	2.4998	20 25 27.1	3.683
3	19 59 24.30	2.4948	20 21 42.2	3.812
4	20 1 53.84	2.4898	20 17 49.6	3.940
5	20 4 23.08	2.4848	20 13 49.4	4.067
6	20 6 52.02	2.4797	20 9 41.6	4.192
7	20 9 20.65	2.4745	20 5 26.3	4.317
8	20 11 48.96	2.4691	20 1 3.6	4.440
9	20 14 16.94	2.4637	19 56 33.5	4.562
10	20 16 44.60	2.4583	19 51 56.1	4.683
11	20 19 11.94	2.4529	19 47 11.5	4.803
12	20 21 38.95	2.4474	19 42 19.7	4.922
13	20 24 5.62	2.4418	19 37 20.8	5.040
14	20 26 31.96	2.4362	19 32 14.9	5.156
15	20 28 57.96	2.4305	19 27 2.1	5.271
16	20 31 23.62	2.4247	19 21 42.4	5.385
17	20 33 48.93	2.4190	19 16 15.9	5.498
18	20 36 13.90	2.4132	19 10 42.6	5.610
19	20 38 38.52	2.4073	19 5 2.7	5.720
20	20 41 2.78	2.4014	18 59 16.2	5.829
21	20 43 26.69	2.3955	18 53 23.2	5.937
22	20 45 50.24	2.3896	18 47 23.8	6.043
23	20 48 13.44	2.3837	S. 18 41 18.0	6.148

TUESDAY 26.

0	20 50 36.28	2.3777	S. 18 35 6.0	6.252
1	20 52 58.76	2.3716	18 28 47.8	6.355
2	20 55 20.87	2.3655	18 22 23.4	6.457
3	20 57 42.62	2.3594	18 15 52.9	6.557
4	21 0 4.00	2.3533	18 9 16.5	6.656
5	21 2 25.02	2.3472	18 2 34.2	6.754
6	21 4 45.67	2.3411	17 55 46.0	6.851
7	21 7 5.95	2.3349	17 48 52.1	6.945
8	21 9 25.86	2.3288	17 41 52.6	7.039
9	21 11 45.40	2.3227	17 34 47.4	7.132
10	21 14 4.58	2.3166	17 27 36.7	7.223
11	21 16 23.39	2.3104	17 20 20.6	7.312
12	21 18 41.83	2.3042	17 12 59.2	7.401
13	21 20 59.90	2.2980	17 5 32.5	7.489
14	21 23 17.59	2.2918	16 58 0.5	7.576
15	21 25 34.91	2.2856	16 50 23.4	7.660
16	21 27 51.86	2.2794	16 42 41.3	7.744
17	21 30 8.44	2.2732	16 34 54.1	7.827
18	21 32 24.65	2.2671	16 27 2.0	7.908
19	21 34 40.49	2.2610	16 19 5.1	7.987
20	21 36 55.97	2.2549	16 11 3.5	8.066
21	21 39 11.08	2.2488	16 2 57.2	8.143
22	21 41 25.82	2.2427	15 54 46.3	8.220
23	21 43 40.20	2.2366	15 46 30.8	8.295
24	21 45 54.21	2.2305	S. 15 38 10.9	8.368

WEDNESDAY 27.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	21 45 54.21	2.2305	S. 15 38 10.9	8.368
1	21 48 7.86	2.2245	15 29 46.6	8.441
2	21 50 21.15	2.2184	15 21 18.0	8.512
3	21 52 34.07	2.2123	15 12 45.2	8.582
4	21 54 46.63	2.2064	15 4 8.2	8.651
5	21 56 58.84	2.2005	14 55 27.1	8.718
6	21 59 10.69	2.1946	14 46 42.0	8.785
7	22 1 22.19	2.1887	14 37 52.9	8.851
8	22 3 33.34	2.1828	14 28 59.9	8.914
9	22 5 44.13	2.1769	14 20 3.2	8.977
10	22 7 54.57	2.1711	14 11 2.7	9.039
11	22 10 4.67	2.1654	14 1 58.5	9.099
12	22 12 14.42	2.1597	13 52 50.8	9.158
13	22 14 23.83	2.1540	13 43 39.6	9.216
14	22 16 32.90	2.1483	13 34 24.9	9.274
15	22 18 41.63	2.1427	13 25 6.7	9.331
16	22 20 50.02	2.1371	13 15 45.2	9.385
17	22 22 58.08	2.1316	13 6 20.5	9.438
18	22 25 5.81	2.1261	12 56 52.6	9.491
19	22 27 13.21	2.1206	12 47 21.6	9.542
20	22 29 20.28	2.1152	12 37 47.5	9.593
21	22 31 27.03	2.1098	12 28 10.4	9.642
22	22 33 33.46	2.1045	12 18 30.4	9 691
23	22 35 39.57	2.0992	S. 12 8 47.5	9.738

THURSDAY 28.

0	22 37 45.36	2.0939	S. 11 59 1.8	9.784
1	22 39 50.84	2.0887	11 49 13.4	9.829
2	22 41 56.01	2.0836	11 39 22.3	9.873
3	22 44 0.87	2.0785	11 29 28.6	9.916
4	22 46 5.43	2.0735	11 19 32.4	9.958
5	22 48 9.69	2.0685	11 9 33.6	10.000
6	22 50 13.65	2.0636	10 59 32.4	10.040
7	22 52 17.32	2.0587	10 49 28.8	10.079
8	22 54 20.69	2.0538	10 39 22.9	10.117
9	22 56 23.77	2.0490	10 29 14.8	10.154
10	22 58 26.57	2.0443	10 19 4.5	10.190
11	23 0 29.09	2.0397	10 8 52.0	10.225
12	23 2 31.33	2.0350	9 58 37.5	10.259
13	23 4 33.29	2.0304	9 48 21.0	10.292
14	23 6 34.98	2.0258	9 38 2.5	10.325
15	23 8 36.40	2.0213	9 27 42.0	10.357
16	23 10 37.55	2.0170	9 17 19.6	10.387
17	23 12 38.44	2.0127	9 6 55.5	10.416
18	23 14 39.07	2.0084	8 56 29.7	10.444
19	23 16 39.45	2.0041	8 46 2.2	10.472
20	23 18 39.57	1.9999	8 35 33.0	10.500
21	23 20 39.44	1.9958	8 25 2.2	10.527
22	23 22 39.07	1.9918	8 14 29.8	10.552
23	23 24 38.46	1.9878	8 3 56.0	10.575
24	23 26 37.61	1.9839	S. 7 53 20.8	10.598

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	FRIDAY 29.			
	h m s	s	° ′ ″	″
0	23 26 37.61	1.9839	S. 7 53 20.8	10.598
1	23 28 36.53	1.9800	7 42 44.2	10.621
2	23 30 35.21	1.9761	7 32 6.2	10.643
3	23 32 33.66	1.9723	7 21 27.0	10.664
4	23 34 31.89	1.9686	7 10 46.5	10.685
5	23 36 29.90	1.9650	7 0 4.8	10.704
6	23 38 27.69	1.9614	6 49 22.0	10.723
7	23 40 25.27	1.9579	6 38 38.1	10.741
8	23 42 22.64	1.9544	6 27 53.1	10.757
9	23 44 19.80	1.9510	6 17 7.2	10.773
10	23 46 16.76	1.9476	6 6 20.3	10.789
11	23 48 13.52	1.9443	5 55 32.5	10.804
12	23 50 10.08	1.9411	5 44 43.8	10.818
13	23 52 6.45	1.9380	5 33 54.3	10.831
14	23 54 2.64	1.9349	5 23 4.1	10.844
15	23 55 58.64	1.9318	5 12 13.1	10.856
16	23 57 54.46	1.9289	5 1 21.4	10.867
17	23 59 50.11	1.9260	4 50 29.1	10.877
18	0 1 45.58	1.9231	4 39 36.2	10.886
19	0 3 40.88	1.9203	4 28 42.8	10.895
20	0 5 36.02	1.9176	4 17 48.8	10.904
21	0 7 31.00	1.9150	4 6 54.3	10.912
22	0 9 25.82	1.9124	3 55 59.4	10.918
23	0 11 20.48	1.9098	S. 3 45 4.2	10.923
	SATURDAY 30.			
0	0 13 14.99	1.9073	S. 3 34 8.6	10.928
1	0 15 9.36	1.9049	3 23 12.7	10.933
2	0 17 3.58	1.9025	3 12 16.6	10.938
3	0 18 57.66	1.9003	3 1 20.2	10.942
4	0 20 51.61	1.8981	2 50 23.6	10.944
5	0 22 45.43	1.8959	2 39 26.9	10.946
6	0 24 39.11	1.8937	2 28 30.1	10.947
7	0 26 32.67	1.8917	2 17 33.2	10.948
8	0 28 26.11	1.8897	2 6 36.3	10.948
9	0 30 19.43	1.8878	1 55 39.4	10.947
10	0 32 12.64	1.8859	1 44 42.6	10.947
11	0 34 5.74	1.8841	1 33 45.8	10.946
12	0 35 58.73	1.8824	1 22 49.1	10.943
13	0 37 51.62	1.8807	1 11 52.6	10.940
14	0 39 44.41	1.8790	1 0 56.3	10.936
15	0 41 37.10	1.8774	0 50 0.3	10.932
16	0 43 29.70	1.8760	0 39 4.5	10.928
17	0 45 22.22	1.8746	0 28 9.0	10.922
18	0 47 14.65	1.8732	0 17 13.9	10.915
19	0 49 7.00	1.8718	S. 0 6 19.2	10.908
20	0 50 59.27	1.8706	N. 0 4 35.1	10.901
21	0 52 51.47	1.8694	0 15 29.0	10.894
22	0 54 43.60	1.8683	0 26 22.4	10.885
23	0 56 35.66	1.8672	0 37 15.2	10.876
24	0 58 27.66	1.8662	N. 0 48 7.5	10.867

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SUNDAY, JULY 1.			
	h m s	s	° ′ ″	″
0	0 58 27.66	1.8662	N. 0 48 7.5	10.867

PHASES OF THE MOON.

		d	h	m
☾	Last Quarter. . June	1	0	53.3
●	New Moon	9	4	34.0
☽	First Quarter . . .	16	18	49.7
○	Full Moon	23	9	7.5
☾	Last Quarter. . . .	30	15	52.6

		d	h
☾	Apogee. . . . June	5	21.2
☾	Perigee.	21	12.1

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	III^{h}.	P. L. of Diff.	VI^{h}.	P. L. of Diff.	IX^{h}.	P. L. of Diff.
1	Antares	W.	92° 27′ 16″	2897	93° 59′ 39″	2911	95° 31′ 44″	2924	97° 3′ 32″	2938
	α Aquilæ	W.	50 47 49	3905	52 1 4	3874	53 14 50	3847	54 29 4	3822
	α Arietis	E.	56 29 55	3073	55 1 13	3096	53 32 58	3119	52 5 11	3143
	Sun	E.	90 25 30	3205	88 59 27	3220	87 33 41	3234	86 8 12	3247
2	α Aquilæ	W.	60 45 37	3737	62 1 45	3726	63 18 5	3715	64 34 36	3706
	α Arietis	E.	44 53 35	3271	43 28 50	3300	42 4 38	3331	40 41 2	3364
	Sun	E.	79 4 41	3311	77 40 42	3322	76 16 56	3332	74 53 22	3344
3	α Aquilæ	W.	70 59 16	3675	72 16 30	3671	73 33 48	3667	74 51 10	3665
	Fomalhaut	W.	36 6 21	3731	37 22 35	3690	38 39 33	3653	39 57 10	3622
	α Pegasi	W.	27 24 29	5781	28 12 2	5516	29 2 35	5288	29 55 51	5092
	Sun	E.	67 58 25	3389	66 35 56	3397	65 13 36	3404	63 51 24	3410
4	α Aquilæ	W.	81 18 31	3658	82 36 3	3658	83 53 35	3658	85 11 7	3658
	Fomalhaut	W.	46 32 39	3507	47 52 55	3491	49 13 29	3475	50 34 21	3462
	α Pegasi	W.	34 54 56	4421	35 59 58	4330	37 6 23	4249	38 14 3	4176
	Sun	E.	57 2 10	3439	55 40 38	3444	54 19 11	3447	52 57 47	3450
5	Fomalhaut	W.	57 22 12	3405	58 44 23	3396	60 6 44	3387	61 29 15	3378
	α Pegasi	W.	44 7 43	3906	45 20 57	3865	46 34 52	3829	47 49 24	3795
	Sun	E.	46 11 43	3463	44 50 38	3465	43 29 35	3466	42 8 33	3468
6	Fomalhaut	W.	68 24 5	3342	69 47 28	3336	71 10 58	3330	72 34 35	3323
	α Pegasi	W.	54 10 7	3659	55 27 38	3637	56 45 32	3617	58 3 48	3598
	Sun	E.	35 23 39	3470	34 2 41	3469	32 41 42	3470	31 20 44	3470
7	Fomalhaut	W.	79 34 29	3294	80 58 48	3288	82 23 13	3282	83 47 45	3277
	α Pegasi	W.	64 40 2	3516	66 0 8	3502	67 20 30	3488	68 41 7	3476
	Sun	E.	24 35 55	3472	23 15 0	3473	21 54 6	3475	20 33 14	3479
11	Sun	W.	20 26 39	3279	21 51 15	3263	23 16 10	3247	24 41 23	3234
	Regulus	E.	47 1 19	2874	45 28 27	2866	43 55 25	2859	42 22 14	2852
	Mars	E.	93 5 16	2969	91 34 24	2962	90 3 23	2954	88 32 12	2946
	Spica	E.	100 54 44	2905	99 22 31	2897	97 50 8	2889	96 17 35	2880
12	Sun	W.	31 51 14	3174	33 17 51	3163	34 44 48	3152	36 11 55	3140
	Regulus	E.	34 33 49	2813	32 59 38	2805	31 25 16	2797	29 50 44	2788
	Mars	E.	80 53 54	2908	79 21 45	2899	77 49 25	2891	76 16 55	2883
	Spica	E.	88 32 8	2838	86 58 30	2831	85 24 42	2822	83 50 43	2813
13	Sun	W.	43 30 53	3085	44 59 21	3073	46 28 3	3063	47 56 58	3052
	Mars	E.	68 31 43	2841	66 58 8	2831	65 24 21	2823	63 50 23	2814
	Spica	E.	75 57 57	2769	74 22 49	2760	72 47 29	2752	71 11 58	2743
	Jupiter	E.	112 27 0	2707	110 50 29	2697	109 13 45	2688	107 36 49	2678
14	Sun	W.	55 25 4	2994	56 55 24	2982	58 25 59	2970	59 56 49	2958
	Pollux	W.	27 53 58	2820	29 28 0	2793	31 2 37	2769	32 37 45	2747
	Saturn	W.	15 2 42	2691	16 39 31	2680	18 16 41	2669	19 54 2	2658
	Mars	E.	55 57 39	2769	54 22 31	2760	52 47 11	2751	51 11 39	2741
	Spica	E.	63 11 22	2697	61 34 38	2688	59 57 42	2679	58 20 34	2670
	Jupiter	E.	99 28 50	2628	97 50 33	2618	96 12 2	2607	94 33 16	2596

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^h.	P. L. of Diff.	XVIII^h.	P. L. of Diff.	XXI^h.	P. L. of Diff.
1	Antares	W.	98° 35′ 3″	2951	100° 6′ 17″	2963	101° 37′ 16″	2975	103° 8′ 0″	2987
	α Aquilæ	W.	55 43 43	3801	56 58 44	3782	58 14 5	3766	59 29 43	3750
	α Arietis	E.	50 37 53	3166	49 11 3	3191	47 44 43	3216	46 18 53	3243
	Sun	E.	84 42 59	3261	83 18 2	3275	81 53 21	3287	80 28 54	3299
2	α Aquilæ	W.	65 51 17	3698	67 8 6	3691	68 25 3	3684	69 42 7	3679
	α Arietis	E.	39 18 4	3399	37 55 46	3436	36 34 10	3477	35 13 20	3522
	Sun	E.	73 30 1	3354	72 6 52	3363	70 43 53	3372	69 21 4	3380
3	α Aquilæ	W.	76 8 34	3663	77 26 1	3661	78 43 30	3660	80 1 0	3659
	Fomalhaut	W.	41 15 21	3594	42 34 2	3569	43 53 10	3546	45 12 43	3525
	α Pegasi	W.	30 51 35	4920	31 49 34	4771	32 49 34	4639	33 51 25	4524
	Sun	E.	62 29 19	3417	61 7 22	3423	59 45 32	3429	58 23 48	3434
4	α Aquilæ	W.	86 28 39	3659	87 46 10	3660	89 3 40	3662	90 21 8	3663
	Fomalhaut	W.	51 55 28	3449	53 16 49	3437	54 38 24	3425	56 0 12	3415
	α Pegasi	W.	39 22 52	4110	40 32 44	4051	41 43 33	3999	42 55 14	3950
	Sun	E.	51 36 27	3454	50 15 11	3457	48 53 59	3460	47 32 50	3462
5	Fomalhaut	W.	62 51 56	3371	64 14 46	3364	65 37 44	3357	67 0 50	3349
	α Pegasi	W.	49 4 31	3764	50 20 11	3734	51 36 22	3708	52 53 1	3682
	Sun	E.	40 47 33	3469	39 26 34	3469	38 5 35	3470	36 44 37	3470
6	Fomalhaut	W.	73 58 20	3317	75 22 12	3311	76 46 11	3305	78 10 17	3300
	α Pegasi	W.	59 22 25	3579	60 41 22	3562	62 0 38	3545	63 20 12	3531
	Sun	E.	29 59 46	3470	28 38 48	3470	27 17 50	3470	25 56 52	3471
7	Fomalhaut	W.	85 12 23	3272	86 37 7	3267	88 1 57	3263	89 26 52	3258
	α Pegasi	W.	70 1 58	3463	71 23 3	3452	72 44 21	3441	74 5 51	3431
	Sun	E.	19 12 26	3484	17 51 44	3492	16 31 11	3504	15 10 51	3522
11	Sun	W.	26 6 52	3221	27 32 36	3209	28 58 34	3197	30 24 47	3185
	Regulus	E.	40 48 53	2844	39 15 22	2836	37 41 41	2828	36 7 50	2821
	Mars	E.	87 0 52	2939	85 29 22	2931	83 57 42	2924	82 25 53	2916
	Spica	E.	94 44 51	2872	93 11 56	2864	91 38 51	2855	90 5 35	2848
12	Sun	W.	37 39 16	3129	39 6 50	3118	40 34 38	3107	42 2 39	3096
	Regulus	E.	28 16 1	2781	26 41 8	2773	25 6 5	2766	23 30 53	2760
	Mars	E.	74 44 14	2874	73 11 22	2866	71 38 20	2858	70 5 7	2849
	Spica	E.	82 16 32	2805	80 42 10	2796	79 7 37	2788	77 32 53	2779
13	Sun	W.	49 26 7	3040	50 55 30	3029	52 25 7	3018	53 54 58	3005
	Mars	E.	62 16 13	2805	60 41 52	2796	59 7 19	2788	57 32 35	2779
	Spica	E.	69 36 15	2734	68 0 20	2725	66 24 13	2716	64 47 54	2706
	Jupiter	E.	105 59 40	2669	104 22 18	2658	102 44 42	2649	101 6 53	2638
14	Sun	W.	61 27 54	2946	62 59 14	2935	64 30 49	2922	66 2 40	2909
	Pollux	W.	34 13 23	2725	35 49 29	2706	37 26 1	2687	39 2 58	2669
	Saturn	W.	21 31 38	2647	23 9 29	2636	24 47 35	2625	26 25 56	2614
	Mars	E.	49 35 54	2732	47 59 57	2724	46 23 49	2715	44 47 29	2706
	Spica	E.	56 43 14	2661	55 5 42	2652	53 27 57	2643	51 50 1	2635
	Jupiter	E.	92 54 16	2586	91 15 2	2574	89 35 32	2564	87 55 47	2553

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	III^{h}.	P. L. of Diff.	VI^{h}.	P. L. of Diff.	IX^{h}.	P. L. of Diff.
14	Antares	E.	109° 5′ 0″	2709	107° 28′ 32″	2698	105° 51′ 49″	2687	104° 14′ 51″	2675
15	Sun	W.	67 34 47	2897	69 7 9	2885	70 39 48	2872	72 12 43	2859
	Pollux	W.	40 40 19	2652	42 18 3	2635	43 56 10	2618	45 34 40	2602
	Saturn	W.	28 4 32	2602	29 43 24	2591	31 22 32	2579	33 1 56	2567
	Mars	E.	43 10 57	2697	41 34 13	2689	39 57 18	2681	38 20 12	2673
	Spica	E.	50 11 53	2626	48 33 34	2618	46 55 3	2610	45 16 21	2601
	Jupiter	E.	86 15 47	2541	84 35 31	2530	82 55 0	2519	81 14 13	2508
	Antares	E.	96 6 5	2617	94 27 33	2605	92 48 45	2593	91 9 41	2581
16	Sun	W.	80 1 28	2794	81 36 4	2780	83 10 58	2767	84 46 9	2754
	Pollux	W.	53 52 26	2527	55 33 1	2513	57 13 56	2499	58 55 11	2485
	Saturn	W.	41 23 2	2507	43 4 5	2494	44 45 26	2482	46 27 4	2470
	Regulus	W.	17 42 30	2497	19 23 48	2480	21 5 29	2465	22 47 32	2450
	Mars	E.	30 12 19	2643	28 34 22	2640	26 56 22	2639	25 18 20	2640
	Spica	E.	37 0 25	2572	35 20 51	2568	33 41 12	2566	32 1 30	2566
	Jupiter	E.	72 46 19	2449	71 3 54	2438	69 21 13	2426	67 38 15	2414
	Antares	E.	82 50 16	2522	81 9 34	2511	79 28 36	2499	77 47 22	2488
17	Sun	W.	92 46 27	2687	94 23 24	2674	96 0 39	2660	97 38 12	2647
	Pollux	W.	67 26 18	2416	69 9 30	2403	70 53 1	2389	72 36 51	2377
	Saturn	W.	54 59 37	2408	56 43 1	2396	58 26 42	2383	60 10 41	2371
	Regulus	W.	31 22 48	2382	33 6 49	2368	34 51 9	2355	36 35 48	2343
	Jupiter	E.	58 59 12	2355	57 14 33	2343	55 29 36	2331	53 44 22	2320
	Antares	E.	69 17 9	2431	67 34 19	2420	65 51 13	2410	64 7 52	2399
18	Sun	W.	105 50 23	2583	107 29 42	2570	109 9 18	2558	110 49 11	2546
	Pollux	W.	81 20 36	2314	83 6 15	2302	84 52 12	2290	86 38 26	2279
	Saturn	W.	68 55 2	2310	70 40 47	2298	72 26 49	2287	74 13 8	2276
	Regulus	W.	45 23 37	2281	47 10 5	2269	48 56 50	2257	50 43 53	2245
	Jupiter	E.	44 54 8	2266	43 7 18	2256	41 20 13	2245	39 32 53	2236
	Antares	E.	55 27 30	2352	53 42 46	2344	51 57 50	2336	50 12 43	2330
19	Sun	W.	119 12 39	2490	120 54 6	2480	122 35 48	2469	124 17 45	2459
	Saturn	W.	83 8 47	2222	84 56 42	2212	86 44 51	2202	88 33 15	2194
	Regulus	W.	59 43 17	2192	61 31 57	2182	63 20 52	2172	65 10 2	2163
	Jupiter	E.	30 32 59	2198	28 44 28	2192	26 55 49	2189	25 7 5	2187
	Antares	E.	41 25 4	2309	39 39 17	2309	37 53 30	2311	36 7 46	2314
	α Aquilæ	E.	89 27 31	2775	87 52 31	2767	86 17 20	2760	84 41 59	2754
20	Regulus	W.	74 19 9	2122	76 9 34	2116	78 0 9	2109	79 50 54	2103
	Mars	W.	26 17 5	2309	28 2 52	2291	29 49 5	2275	31 35 41	2262
	Spica	W.	21 29 13	2370	23 13 31	2328	24 58 50	2294	26 44 59	2265
	α Aquilæ	E.	76 44 4	2749	75 8 29	2753	73 33 0	2760	71 57 39	2768
21	Regulus	W.	89 6 37	2082	90 58 4	2080	92 49 34	2078	94 41 7	2077
	Mars	W.	40 32 40	2220	42 20 38	2214	44 8 44	2210	45 56 57	2206
	Spica	W.	35 44 15	2178	37 33 16	2167	39 22 33	2158	41 12 3	2151
	α Aquilæ	E.	64 4 36	2845	62 31 6	2869	60 58 7	2896	59 25 43	2927
	Fomalhaut	E.	96 12 40	2309	94 26 53	2304	92 41 0	2302	90 55 3	2300
22	Regulus	W.	103 59 4	2080	105 50 34	2082	107 42 1	2085	109 33 24	2088

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^h.	P. L. of Diff.	XVIII^h.	P. L. of Diff.	XXI^h.	P. L. of Diff.
14	Antares	E.	102° 37′ 37″	2663	101° 0′ 7″	2652	99° 22′ 22″	2640	97° 44′ 21″	2629
15	Sun	W.	73 45 55	2845	75 19 24	2833	76 53 9	2821	78 27 10	2808
	Pollux	W.	47 13 32	2587	48 52 45	2572	50 32 18	2557	52 12 12	2543
	Saturn	W.	34 41 36	2555	36 21 33	2543	38 1 46	2531	39 42 16	2520
	Mars	E.	36 42 56	2666	35 5 30	2658	33 27 54	2652	31 50 10	2647
	Spica	E.	43 37 28	2594	41 58 25	2588	40 19 13	2582	38 39 53	2576
	Jupiter	E.	79 33 11	2497	77 51 53	2485	76 10 18	2473	74 28 27	2461
	Antares	E.	89 30 20	2569	87 50 43	2558	86 10 50	2546	84 30 41	2535
16	Sun	W.	86 21 37	2741	87 57 23	2727	89 33 27	2714	91 9 48	2701
	Pollux	W.	60 36 45	2471	62 18 39	2457	64 0 53	2443	65 43 26	2430
	Saturn	W.	48 8 59	2458	49 51 12	2445	51 33 43	2433	53 16 31	2420
	Regulus	W.	24 29 56	2436	26 12 40	2422	27 55 43	2408	29 39 6	2395
	Mars	E.	23 40 19	2643	22 2 23	2652	20 24 39	2667	18 47 15	2689
	Spica	E.	30 21 48	2568	28 42 9	2572	27 2 36	2580	25 23 13	2591
	Jupiter	E.	65 55 0	2402	64 11 28	2390	62 27 39	2379	60 43 34	2367
	Antares	E.	76 5 52	2477	74 24 6	2465	72 42 3	2453	70 59 44	2442
17	Sun	W.	99 16 3	2634	100 54 12	2621	102 32 38	2608	104 11 22	2596
	Pollux	W.	74 20 59	2364	76 5 26	2351	77 50 11	2338	79 35 15	2326
	Saturn	W.	61 54 58	2359	63 39 32	2346	65 24 24	2334	67 9 34	2322
	Regulus	W.	38 20 45	2330	40 6 1	2317	41 51 35	2305	43 37 27	2293
	Jupiter	E.	51 58 52	2309	50 13 5	2298	48 27 2	2287	46 40 43	2276
	Antares	E.	62 24 16	2389	60 40 26	2379	58 56 21	2369	57 12 2	2360
18	Sun	W.	112 29 20	2534	114 9 46	2522	115 50 28	2511	117 31 26	2500
	Pollux	W.	88 24 57	2268	90 11 44	2256	91 58 48	2246	93 46 7	2236
	Saturn	W.	75 59 43	2264	77 46 35	2253	79 33 43	2243	81 21 7	2232
	Regulus	W.	52 31 13	2234	54 18 50	2223	56 6 43	2212	57 54 52	2202
	Jupiter	E.	37 45 19	2227	35 57 32	2218	34 9 32	2211	32 21 21	2204
	Antares	E.	48 27 27	2324	46 42 2	2218	44 56 29	2313	43 10 49	2310
19	Sun	W.	125 59 56	2450	127 42 20	2441	129 24 56	2433	131 7 43	2426
	Saturn	W.	90 21 52	2184	92 10 43	2176	93 59 47	2168	95 49 3	2161
	Regulus	W.	66 59 26	2154	68 49 3	2145	70 38 53	2137	72 28 55	2130
	Jupiter	E.	23 18 18	2187	21 29 31	2190	19 40 48	2197	17 52 16	2211
	Antares	E.	34 22 7	2320	32 36 37	2329	30 51 20	2342	29 6 22	2360
	α Aquilæ	E.	83 6 31	2750	81 30 57	2747	79 55 20	2747	78 19 42	2747
20	Regulus	W.	81 41 48	2098	83 32 50	2094	85 23 59	2089	87 15 15	2085
	Mars	W.	33 22 36	2251	35 9 47	2241	36 57 13	2233	38 44 51	2226
	Spica	W.	28 31 50	2241	30 19 16	2222	32 7 11	2204	33 55 32	2190
	α Aquilæ	E.	70 22 29	2779	68 47 33	2791	67 12 53	2805	65 38 33	2824
21	Regulus	W.	96 32 42	2075	98 24 19	2075	100 15 56	2077	102 7 31	2078
	Mars	W.	47 45 15	2204	49 33 37	2202	51 22 1	2202	53 10 26	2202
	Spica	W.	43 1 44	2145	44 51 34	2141	46 41 31	2137	48 31 34	2135
	α Aquilæ	E.	57 53 58	2962	56 22 57	3001	54 52 46	3046	53 23 30	3096
	Fomalhaut	E.	89 9 4	2300	87 23 5	2300	85 37 6	2302	83 51 9	2304
22	Regulus	W.	111 24 42	2092	113 15 53	2098	115 6 56	2104	116 57 49	2111

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	III^h.	P. L. of Diff.	VI^h.	P. L. of Diff.	IX^h.	P. L. of Diff.
22	MARS	W.	54° 58′ 51″	2202	56° 47′ 15″	2203	58° 35′ 37″	2206	60° 23′ 55″	2210
	Spica	W.	50 21 40	2134	52 11 48	2133	54 1 57	2134	55 52 5	2135
	α Aquilæ	E.	51 55 15	3151	50 28 7	3213	49 2 13	3282	47 37 41	3361
	Fomalhaut	E.	82 5 16	2308	80 19 29	2313	78 33 49	2320	76 48 18	2326
	α Pegasi	E.	97 43 37	2456	96 1 22	2456	94 19 7	2458	92 36 54	2460
23	MARS	W.	69 23 52	2236	71 11 26	2244	72 58 48	2252	74 45 58	2260
	Spica	W.	65 1 47	2155	66 51 23	2161	68 40 49	2169	70 30 4	2176
	JUPITER	W.	29 21 22	2125	31 11 43	2128	33 1 59	2134	34 52 7	2139
	Antares	W.	20 20 7	2531	22 0 37	2477	23 42 23	2436	25 25 6	2405
	Fomalhaut	E.	68 3 57	2382	66 19 56	2397	64 36 17	2414	62 53 2	2431
	α Pegasi	E.	84 7 22	2494	82 26 0	2504	80 44 52	2516	79 4 1	2530
24	MARS	W.	83 38 17	2314	85 23 56	2326	87 9 17	2339	88 54 19	2353
	Spica	W.	79 33 7	2225	81 20 58	2236	83 8 32	2249	84 55 47	2261
	JUPITER	W.	44 0 2	2182	45 48 56	2194	47 37 33	2205	49 25 53	2217
	Antares	W.	34 6 18	2346	35 51 11	2344	37 36 6	2345	39 21 0	2348
	Fomalhaut	E.	54 23 56	2548	52 43 50	2578	51 4 25	2610	49 25 44	2646
	α Pegasi	E.	70 45 6	2618	69 6 36	2641	67 28 37	2666	65 51 11	2691
25	MARS	W.	97 34 21	2428	99 17 16	2444	100 59 48	2461	102 41 56	2478
	Spica	W.	93 47 10	2332	95 32 23	2348	97 17 13	2364	99 1 40	2380
	JUPITER	W.	58 22 48	2285	60 9 10	2300	61 55 10	2315	63 40 47	2331
	Antares	W.	48 3 34	2386	49 47 29	2397	51 31 8	2409	53 14 30	2421
	Fomalhaut	E.	41 25 28	2873	39 52 34	2931	38 20 55	2997	36 50 39	3070
	α Pegasi	E.	57 53 25	2850	56 20 2	2888	54 47 28	2930	53 15 47	2973
	α Arietis	E.	99 48 49	2455	98 6 33	2469	96 24 36	2483	94 42 59	2499
26	JUPITER	W.	72 23 5	2412	74 6 22	2430	75 49 14	2448	77 31 41	2465
	Antares	W.	61 46 43	2491	63 28 9	2507	65 9 13	2522	66 49 55	2538
	α Pegasi	E.	45 52 27	3250	44 27 17	3319	43 3 27	3394	41 41 4	3477
	α Arietis	E.	86 20 30	2583	84 41 11	2601	83 2 17	2619	81 23 48	2638
27	JUPITER	W.	85 57 52	2552	87 37 53	2570	89 17 29	2588	90 56 41	2605
	Antares	W.	75 7 50	2621	76 46 16	2638	78 24 20	2655	80 2 1	2672
	α Aquilæ	W.	38 26 6	4557	39 29 8	4435	40 33 58	4328	41 40 25	4234
	α Arietis	E.	73 17 54	2738	71 42 4	2759	70 6 42	2780	68 31 48	2801
	SUN	E.	132 42 20	2896	131 9 56	2915	129 37 56	2933	128 6 19	2952
28	JUPITER	W.	99 6 48	2690	100 43 41	2707	102 20 11	2723	103 56 20	2740
	Antares	W.	88 4 46	2756	89 40 12	2772	91 15 17	2788	92 50 0	2805
	α Aquilæ	W.	47 31 24	3917	48 44 27	3874	49 58 13	3837	51 12 37	3804
	α Arietis	E.	60 44 23	2913	59 12 21	2937	57 40 49	2962	56 9 48	2986
	SUN	E.	120 34 3	3043	119 4 43	3060	117 35 45	3078	116 7 9	3095
29	α Aquilæ	W.	57 31 48	3694	58 48 41	3680	60 5 49	3668	61 23 10	3658
	α Arietis	E.	48 42 35	3119	47 14 48	3148	45 47 36	3178	44 21 0	3210
	SUN	E.	108 49 11	3177	107 22 34	3192	105 56 15	3207	104 30 14	3221
30	α Aquilæ	W.	67 52 6	3628	69 10 10	3625	70 28 17	3623	71 46 27	3622
	Fomalhaut	W.	32 54 43	3782	34 10 4	3728	35 26 21	3682	36 43 27	3643
	SUN	E.	97 24 17	3288	95 59 52	3300	94 35 41	3312	93 11 43	3322

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^h.	P. L. of Diff.	XVIII^h.	P. L. of Diff.	XXI^h.	P. L. of Diff.
22	Mars	W.	62° 12′ 8″	2214	64° 0′ 15″	2218	65° 48′ 15″	2223	67° 36′ 8″	2229
	Spica	W.	57 42 11	2137	59 32 13	2140	61 22 11	2144	63 12 3	2149
	α Aquilæ	E.	46 14 40	3448	44 53 18	3545	43 33 44	3655	42 16 9	3779
	Fomalhaut	E.	75 2 57	2335	73 17 49	2345	71 32 55	2356	69 48 17	2368
	α Pegasi	E.	90 54 45	2464	89 12 41	2469	87 30 44	2476	85 48 57	2485
23	Mars	W.	76 32 56	2270	78 19 40	2280	80 6 9	2291	81 52 21	2302
	Spica	W.	73 19 8	2184	74 7 59	2193	75 56 37	2203	77 45 0	2214
	Jupiter	W.	36 42 6	2147	38 31 54	2155	40 21 30	2163	42 10 53	2172
	Antares	W.	27 8 33	2363	28 52 32	2368	30 36 53	2357	32 21 30	2349
	Fomalhaut	E.	61 10 12	2451	59 27 50	2473	57 45 59	2496	56 4 40	2521
	α Pegasi	E.	77 23 29	2545	75 43 18	2561	74 3 29	2578	72 24 4	2598
24	Mars	W.	90 39 1	2368	92 23 22	2382	94 7 23	2396	95 51 3	2412
	Spica	W.	86 42 44	2274	88 29 22	2288	90 15 39	2302	92 1 35	2317
	Jupiter	W.	51 13 55	2230	53 1 38	2243	54 49 2	2257	56 36 5	2270
	Antares	W.	41 5 49	2353	42 50 31	2359	44 35 4	2368	46 19 25	2376
	Fomalhaut	E.	47 47 51	2624	46 10 49	2724	44 34 41	2769	42 59 32	2818
	α Pegasi	E.	64 11 19	2719	62 38 4	2749	61 2 29	2780	59 27 35	2814
25	Mars	W.	104 23 40	2495	106 5 0	2512	107 45 56	2530	109 26 27	2549
	Spica	W.	100 45 44	2396	102 29 25	2413	104 12 41	2431	105 55 32	2448
	Jupiter	W.	65 26 1	2347	67 10 52	2363	68 55 20	2380	70 39 24	2396
	Antares	W.	54 57 35	2433	56 40 22	2448	58 22 49	2462	60 4 56	2476
	Fomalhaut	E.	35 21 53	3152	33 54 46	3244	32 29 29	3347	31 6 12	3465
	α Pegasi	E.	51 45 1	3021	50 15 14	3072	48 46 30	3127	47 18 53	3186
	α Arietis	E.	93 1 41	2515	91 20 51	2530	89 40 20	2548	88 0 13	2565
26	Jupiter	W.	79 13 44	2482	80 55 23	2499	82 36 37	2517	84 17 27	2535
	Antares	W.	68 30 15	2554	70 10 13	2571	71 49 48	2588	73 29 0	2604
	α Pegasi	E.	40 20 14	3567	39 1 4	3666	37 43 41	3775	36 28 13	3896
	α Arietis	E.	79 45 44	2657	78 8 6	2677	76 30 55	2697	74 54 11	2717
27	Jupiter	W.	92 35 29	2632	94 13 54	2640	95 51 55	2657	97 29 33	2674
	Antares	W.	81 39 19	2689	83 16 14	2705	84 52 47	2722	86 28 58	2739
	α Aquilæ	W.	42 48 19	4153	43 57 30	4082	45 7 49	4020	46 19 9	3964
	α Arietis	E.	66 57 22	2823	65 23 24	2845	63 49 55	2867	62 16 51	2891
	Sun	E.	126 35 6	2970	125 4 16	2989	123 33 49	3007	122 3 45	3025
28	Jupiter	W.	105 32 7	2756	107 7 33	2771	108 42 39	2787	110 17 24	2802
	Antares	W.	94 21 22	2820	95 58 24	2836	97 32 5	2852	99 5 25	2868
	α Aquilæ	W.	52 27 35	3775	53 43 3	3751	51 58 56	3729	56 15 12	3710
	α Arietis	E.	54 39 18	3011	53 9 19	3036	51 39 51	3063	50 10 56	3091
	Sun	E.	114 38 53	3112	113 10 58	3129	111 43 23	3144	110 16 7	3161
29	α Aquilæ	W.	62 40 42	3649	63 58 23	3643	65 16 11	3636	66 34 6	3632
	α Arietis	E.	42 55 3	3243	41 29 45	3279	40 5 9	3316	38 41 16	3356
	Sun	E.	103 4 30	3236	101 39 3	3249	100 13 52	3263	98 48 57	3276
30	α Aquilæ	W.	73 4 38	3622	74 22 49	3622	75 41 0	3622	76 59 11	3623
	Fomalhaut	W.	38 1 15	3609	39 19 40	3578	40 38 38	3551	41 58 6	3528
	Sun	E.	91 47 57	3333	90 24 24	3344	89 1 3	3353	87 37 53	3362

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.	Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Added to Apparent Time.	Diff. for 1 Hour.
		h m s	s	° ′ ″	″	′ ″	s	m s	s
SUN.	1	6 43 31.51	10.333	N.23 4 29.4	−10.74	15 46.12	68.76	3 38.49	0.476
Mon.	2	6 47 39.38	10.322	22 59 59.4	11.75	15 46.11	68.72	3 49.78	0.465
Tues.	3	6 51 46.99	10.311	22 55 5.4	12.75	15 46.11	68.68	4 0.80	0.454
Wed.	4	6 55 54.31	10.298	22 49 47.4	−13.74	15 46.11	68.63	4 11.54	0.441
Thur.	5	7 0 1.32	10.285	22 44 5.6	14.73	15 46.11	68.58	4 21.96	0.428
Frid.	6	7 4 7.99	10.270	22 38 0.1	15.71	15 46.12	68.53	4 32.04	0.413
Sat.	7	7 8 14.30	10.255	22 31 31.1	−16.69	15 46.14	68.48	4 41.77	0.398
SUN.	8	7 12 20.24	10.239	22 24 38.7	17.66	15 46.17	68.43	4 51.13	0.382
Mon.	9	7 16 25.77	10.222	22 17 23.0	18.63	15 46.20	68.37	5 0.08	0.365
Tues.	10	7 20 30.89	10.204	22 9 44.3	−19.58	15 46.23	68.31	5 8.61	0.347
Wed.	11	7 24 35.55	10.185	22 1 42.7	20.53	15 46.27	68.25	5 16.69	0.328
Thur.	12	7 28 39.74	10.165	21 53 18.4	21.47	15 46.32	68.19	5 24.30	0.308
Frid.	13	7 32 43.46	10.145	21 44 31.6	−22.41	15 46.37	68.12	5 31.44	0.288
Sat.	14	7 36 46.68	10.124	21 35 22.5	23.33	15 46.43	68.05	5 38.08	0.267
SUN.	15	7 40 49.38	10.102	21 25 51.3	24.25	15 46.49	67.98	5 44.21	0.245
Mon.	16	7 44 51.55	10.080	21 15 58.4	−25.15	15 46.55	67.91	5 49.81	0.223
Tues.	17	7 48 53.17	10.057	21 5 43.8	26.05	15 46.62	67.83	5 54.87	0.200
Wed.	18	7 52 54.24	10.033	20 55 7.7	26.93	15 46.69	67.76	5 59.38	0.177
Thur.	19	7 56 54.76	10.009	20 44 10.4	−27.81	15 46.77	67.68	6 3.33	0.153
Frid.	20	8 0 54.71	9.986	20 32 52.3	28.68	15 46.85	67.60	6 6.72	0.130
Sat.	21	8 4 54.09	9.962	20 21 13.5	29.54	15 46.94	67.52	6 9.53	0.106
SUN.	22	8 8 52.89	9.938	20 9 14.3	−30.38	15 47.03	67.44	6 11.77	0.082
Mon.	23	8 12 51.11	9.914	19 56 54.8	31.22	15 47.12	67.36	6 13.42	0.058
Tues.	24	8 16 48.74	9.890	19 44 15.4	32.04	15 47.21	67.28	6 14.50	0.034
Wed.	25	8 20 45.79	9.865	19 31 16.3	−32.86	15 47.31	67.19	6 14.99	0.009
Thur.	26	8 24 42.25	9.841	19 17 57.8	33.66	15 47.41	67.11	6 14.90	0.015
Frid.	27	8 28 38.12	9.816	19 4 20.1	34.45	15 47.51	67.02	6 14.22	0.040
Sat.	28	8 32 33.41	9.792	18 50 23.5	−35.24	15 47.62	66.94	6 12.96	0.064
SUN.	29	8 36 28.12	9.768	18 36 8.3	36.02	15 47.73	66.85	6 11.12	0.088
Mon.	30	8 40 22.24	9.744	18 21 34.7	36.77	15 47.84	66.76	6 8.69	0.112
Tues.	31	8 44 15.77	9.719	18 6 43.0	37.52	15 47.96	66.67	6 5.67	0.137
Wed.	32	8 48 8.71	9.695	N.17 51 33.5	−38.26	15 48.08	66.59	6 2.06	0.161

NOTE.—The mean time of semidiameter passing may be found by subtracting 0s.19 from the sidereal time.
The sign — prefixed to the hourly change of declination indicates that north declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Equation of Time, to be Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	m s	s	h m s
SUN.	1	6 43 30.88	10.332	N. 23 4 30.1	−10.74	3 38.46	0.476	6 39 52.42
Mon.	2	6 47 38.72	10.321	23 0 0.2	11.75	3 49.75	0.465	6 43 48.97
Tues.	3	6 51 46.30	10.310	22 55 6.3	12.75	4 0.77	0.454	6 47 45.53
Wed.	4	6 55 53.59	10.297	22 49 48.4	−13.74	4 11.51	0.441	6 51 42.08
Thur.	5	7 0 0.57	10.284	22 44 6.7	14.73	4 21.93	0.428	6 55 38.64
Frid.	6	7 4 7.21	10.269	22 38 1.3	15.71	4 32.01	0.413	6 59 35.20
Sat.	7	7 8 13.50	10.254	22 31 32.4	−16.69	4 41.74	0.398	7 3 31.76
SUN.	8	7 12 19.41	10.238	22 24 40.1	17.66	4 51.10	0.382	7 7 28.31
Mon.	9	7 16 24.92	10.221	22 17 24.5	18.63	5 0.05	0.365	7 11 24.87
Tues.	10	7 20 30.01	10.203	22 9 45.9	−19.58	5 8.58	0.347	7 15 21.43
Wed.	11	7 24 34.65	10.184	22 1 44.4	20.53	5 16.66	0.328	7 19 17.99
Thur.	12	7 28 38.82	10.164	21 53 20.3	21.47	5 24.27	0.308	7 23 14.55
Frid.	13	7 32 42.52	10.144	21 44 33.6	−22.41	5 31.41	0.288	7 27 11.11
Sat.	14	7 36 45.72	10.123	21 35 24.6	23.33	5 38.06	0.267	7 31 7.66
SUN.	15	7 40 48.41	10.101	21 25 53.6	24.25	5 44.19	0.245	7 35 4.22
Mon.	16	7 44 50.56	10.079	21 16 0.8	−25.15	5 49.79	0.223	7 39 0.77
Tues.	17	7 48 52.18	10.056	21 5 46.3	26.05	5 54.85	0.200	7 42 57.33
Wed.	18	7 52 53.25	10.033	20 55 10.3	26.93	5 59.36	0.177	7 46 53.88
Thur.	19	7 56 53.76	10.009	20 44 13.2	−27.81	6 3.32	0.153	7 50 50.41
Frid.	20	8 0 53.70	9.986	20 32 55.2	28.68	6 6.71	0.130	7 54 46.99
Sat.	21	8 4 53.07	9.962	20 21 16.5	29.54	6 9.52	0.106	7 58 43.55
SUN.	22	8 8 51.87	9.938	20 9 17.4	−30.38	6 11.76	0.082	8 2 40.11
Mon.	23	8 12 50.08	9.914	19 56 58.0	31.22	6 13.41	0.058	8 6 36.67
Tues.	24	8 16 47.71	9.890	19 44 18.7	32.04	6 14.49	0.034	8 10 33.22
Wed.	25	8 20 44.76	9.865	19 31 19.7	−32.86	6 14.98	0.009	8 14 29.78
Thur.	26	8 24 41.22	9.841	19 18 1.3	33.66	6 14.89	0.015	8 18 26.33
Frid.	27	8 28 37.10	9.816	19 4 23.7	34.45	6 14.22	0.040	8 22 22.89
Sat.	28	8 32 32.40	9.792	18 50 27.2	−35.24	6 12.96	0.061	8 26 19.44
SUN.	29	8 36 27.11	9.768	18 36 12.0	36.01	6 11.12	0.088	8 30 16.00
Mon.	30	8 40 21.24	9.744	18 21 38.4	36.77	6 8.69	0.112	8 34 12.55
Tues.	31	8 44 14.78	9.719	18 6 46.8	37.52	6 5.67	0.137	8 38 9.11
Wed.	32	8 48 7.73	9.695	N 17 51 37.4	−38.26	6 2.07	0.161	8 42 5.66

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign − prefixed to the hourly change of declination indicates that north declinations are decreasing.

Diff. for 1 hour, +9s.8565. (Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S TRUE LONGITUDE. λ	THE SUN'S TRUE LONGITUDE. λ'	Diff. for 1 Hour.	THE SUN'S LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		° ′ ″	′ ″	″	″			h m s
1	183	100 0 16.3	0 5.9	142.99	− 0.82	0.0072281	+ 2.1	17 17 17.19
2	184	100 57 28.1	57 17.5	143.00	0.85	0.0072322	1.2	17 13 21.27
3	185	101 54 40.2	54 29.4	143.01	0.86	0.0072341	+ 0.3	17 9 25.36
4	186	102 51 52.6	51 41.6	143.02	− 0.83	0.0072337	− 0.7	17 5 29.45
5	187	103 49 5.2	48 54.1	143.03	0.77	0.0072308	1.7	17 1 33.54
6	188	104 46 18.1	46 6.8	143.05	0.69	0.0072254	2.8	16 57 37.62
7	189	105 43 31.4	43 19.9	143.06	− 0.59	0.0072174	− 3.9	16 53 41.71
8	190	106 40 44.9	40 33.2	143.07	0.46	0.0072068	5.0	16 49 45.80
9	191	107 37 58.6	37 46.7	143.08	0.32	0.0071936	6.1	16 45 49.89
10	192	108 35 12.5	35 0.4	143.08	− 0.18	0.0071777	− 7.2	16 41 53.98
11	193	109 32 26.5	32 14.2	143.09	− 0.05	0.0071592	8.2	16 37 58.07
12	194	110 29 40.6	29 28.2	143.09	+ 0.06	0.0071382	9.3	16 34 2.16
13	195	111 26 54.9	26 42.3	143.10	+ 0.17	0.0071147	−10.3	16 30 6.25
14	196	112 24 9.3	23 56.5	143.10	0.25	0.0070888	11.3	16 26 10.34
15	197	113 21 23.8	21 10.9	143.11	0.31	0.0070606	12.2	16 22 14.43
16	198	114 18 38.5	18 25.4	143.12	+ 0.33	0.0070303	−13.0	16 18 18.52
17	199	115 15 53.3	15 40.1	143.13	0.32	0.0069980	13.8	16 14 22.61
18	200	116 13 8.3	12 55.0	143.14	0.28	0.0069639	14.5	16 10 26.70
19	201	117 10 23.6	10 10.2	143.15	+ 0.22	0.0069282	−15.2	16 6 30.79
20	202	118 7 39.3	7 25.7	143.16	0.13	0.0068910	15.9	16 2 34.88
21	203	119 4 55.3	4 41.5	143.18	+ 0.02	0.0068522	16.5	15 58 38.97
22	204	120 2 11.8	1 57.8	143.20	− 0.10	0.0068119	−17.1	15 54 43.05
23	205	120 59 28.9	59 14.8	143.23	0.23	0.0067703	17.7	15 50 47.14
24	206	121 56 46.6	56 32.4	143.26	0.36	0.0067274	18.3	15 46 51.23
25	207	122 54 5.0	53 50.6	143.29	− 0.48	0.0066831	−18.8	15 42 55.32
26	208	123 51 24.3	51 9.7	143.33	0.59	0.0066374	19.3	15 38 59.41
27	209	124 48 44.6	48 29.9	143.37	0.67	0.0065903	19.9	15 35 3.50
28	210	125 46 5.9	45 51.1	143.41	− 0.74	0.0065418	−20.5	15 31 7.59
29	211	126 43 28.2	43 13.3	143.45	0.77	0.0064918	21.2	15 27 11.68
30	212	127 40 51.6	40 36.5	143.50	0.78	0.0064401	21.9	15 23 15.78
31	213	128 38 16.1	38 0.8	143.55	0.76	0.0063867	22.7	15 19 19.87
32	214	129 35 41.8	35 26.4	143.60	− 0.71	0.0063313	−23.5	15 15 23.96

NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ', to the mean equinox of January $0^d.0$.

Diff. for 1 Hour, $-9^s.8296$. (Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	14 55.1	14 52.1	54 38.1	−1.03	54 27.0	−0.82	18 50.5	1.74	21.8
2	14 49.8	14 48.1	54 18.5	0.61	54 12.5	−0.40	19 32.5	1.76	22.8
3	14 47.1	14 46.8	54 8.9	−0.20	54 7.7	0.00	20 15.4	1.82	23.8
4	14 47.1	14 48 0	54 8.8	+0.18	54 12.1	+0.35	20 59.8	1.89	24.8
5	14 49.4	14 51.4	54 17.3	0.51	54 24.4	0.66	21 46.2	1.98	25.8
6	14 53.8	14 56.5	54 33.2	0.79	54 43.4	0.90	22 34.8	2.07	26.8
7	14 59.6	15 3.1	54 54.8	+1.00	55 7.4	+1.08	23 25.2	2.13	27.8
8	15 6.7	15 10.6	55 20.8	1.15	55 34.9	1.20	♂		28.8
9	15 14.5	15 18.6	55 49.5	1.23	56 4.4	1.25	0 16.9	2.17	0.2
10	15 22.7	15 26.9	56 19.5	+1.27	56 34.8	+1.27	1 9.0	2.17	1.2
11	15 31.0	15 35.1	56 50.0	1.26	57 5.1	1.26	2 0.8	2.14	2.2
12	15 39.2	15 43.2	57 20.1	1.24	57 34.8	1.22	2 51.8	2.10	3.2
13	15 47.2	15 51.0	57 49.3	+1.19	58 3.4	+1.16	3 41.8	2.07	4.2
14	15 54.7	15 58.4	58 17.2	1.13	58 30.6	1.09	4 31.2	2.05	5.2
15	16 1.9	16 5.2	58 43.4	1.04	58 55.6	0.99	5 20.6	2.07	6.2
16	16 8.3	16 11.2	59 7.1	+0.92	59 17.6	+0.82	6 11.0	2.13	7.2
17	16 13.7	16 15.8	59 26.8	0.71	59 34.7	0.59	7 3.0	2.22	8.2
18	16 17.6	16 18.8	59 41.0	0.45	59 45.4	+0.28	7 57.4	2.33	9.2
19	16 19.4	16 19.3	59 47.6	+0.08	59 47.4	−0.12	8 54.5	2.43	10.2
20	16 18.6	16 17.1	59 44.7	−0.34	59 39.3	0.56	9 53.6	2.49	11.2
21	16 14.9	16 12.0	59 31.2	0.79	59 20.4	1.01	10 53.6	2.49	12.2
22	16 8.3	16 4.0	59 7.0	−1.21	58 51.3	−1.40	11 52.7	2.42	13.2
23	15 59.2	15 53.8	58 33.4	1.56	58 13.8	1.69	12 49.2	2.29	14.2
24	15 48.1	15 42.1	57 52.8	1.79	57 30.9	1.85	13 42.4	2.14	15.2
25	15 36.0	15 29.9	57 8.5	−1.87	56 46.0	−1.86	14 32.1	2.00	16.2
26	15 23.9	15 18.1	56 24.0	1.81	56 2.7	1.73	15 18.6	1.88	17.2
27	15 12.6	15 7.6	55 42.5	1.62	55 23.9	1.48	16 2.9	1.81	18.2
28	15 3.0	14 58.9	55 7.0	−1.32	54 52.2	−1.14	16 45.7	1.76	19.2
29	14 55.5	14 52.7	54 39.6	0.95	54 29.4	0.75	17 28.0	1.76	20.2
30	14 50.6	14 49.2	54 21.7	0.53	54 16.6	−0.32	18 10.6	1.79	21.2
31	14 48.5	14 48.5	54 14.0	−0.11	54 14.0	+0.11	18 54.3	1.85	22.2
32	14 49.2	14 50.6	54 16.6	+0.32	54 21.6	+0.52	19 39.7	1.94	23.2

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SUNDAY 1.			
	h m s	s	° ′ ″	″
0	0 58 27.66	1.8662	N. 0 48 7.5	10.867
1	1 0 19.60	1.8652	0 58 59.2	10.857
2	1 2 11.49	1.8643	1 9 50.3	10.846
3	1 4 3.32	1.8634	1 20 40.7	10.834
4	1 5 55.10	1.8627	1 31 30.4	10.822
5	1 7 46.84	1.8620	1 42 19.4	10.810
6	1 9 38.54	1.8613	1 53 7.6	10.797
7	1 11 30.20	1.8607	2 3 55.0	10.783
8	1 13 21.83	1.8602	2 14 41.6	10.769
9	1 15 13.42	1.8597	2 25 27.3	10.754
10	1 17 4.99	1.8592	2 36 12.1	10.739
11	1 18 56.53	1.8589	2 46 56.0	10.723
12	1 20 48.05	1.8586	2 57 38.9	10.707
13	1 22 39.56	1.8583	3 8 20.8	10.690
14	1 24 31.05	1.8581	3 19 1.7	10.672
15	1 26 22.53	1.8580	3 29 41.5	10.654
16	1 28 14.01	1.8579	3 40 20.2	10.635
17	1 30 5.48	1.8578	3 50 57.7	10.616
18	1 31 56.95	1.8579	4 1 34.1	10.597
19	1 33 48.43	1.8580	4 12 9.3	10.576
20	1 35 39.91	1.8581	4 22 43.2	10.555
21	1 37 31.40	1.8583	4 33 15.9	10.534
22	1 39 22.91	1.8586	4 43 47.3	10.512
23	1 41 14.43	1.8589	N. 4 54 17.3	10.489
	MONDAY 2.			
0	1 43 5.97	1.8593	N. 5 4 46.0	10.466
1	1 44 57.54	1.8597	5 15 13.3	10.442
2	1 46 49.13	1.8601	5 25 39.1	10.417
3	1 48 40.75	1.8606	5 36 3.4	10.392
4	1 50 32.41	1.8612	5 46 26.2	10.367
5	1 52 24.10	1.8618	5 56 47.5	10.342
6	1 54 15.83	1.8625	6 7 7.3	10.317
7	1 56 7.60	1.8633	6 17 25.5	10.289
8	1 57 59.42	1.8641	6 27 42.0	10.261
9	1 59 51.29	1.8649	6 37 56.8	10.232
10	2 1 43.21	1.8658	6 48 9.9	10.204
11	2 3 35.19	1.8667	6 58 21.3	10.176
12	2 5 27.22	1.8677	7 8 31.0	10.147
13	2 7 19.31	1.8688	7 18 38.9	10.116
14	2 9 11.47	1.8699	7 28 44.9	10.084
15	2 11 3.70	1.8711	7 38 49.0	10.053
16	2 12 56.00	1.8723	7 48 51.2	10.021
17	2 14 48.37	1.8735	7 58 51.5	9.988
18	2 16 40.82	1.8748	8 8 49.8	9.955
19	2 18 33.35	1.8762	8 18 46.1	9.921
20	2 20 25.96	1.8776	8 28 40.3	9.887
21	2 22 18.66	1.8790	8 38 32.5	9.852
22	2 24 11.44	1.8805	8 48 22.6	9.817
23	2 26 4.32	1.8821	8 58 10.5	9.781
24	2 27 57.29	1.8837	N. 9 7 56.3	9.745

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination	Diff. for 1 Minute.
	TUESDAY 3.			
	h m s	s	° ′ ″	″
0	2 27 57.29	1.8837	N. 9 7 56.3	9.745
1	2 29 50.36	1.8853	9 17 39.9	9.707
2	2 31 43.53	1.8870	9 27 21.2	9.669
3	2 33 36.80	1.8887	9 37 0.2	9.631
4	2 35 30.17	1.8904	9 46 36.9	9.592
5	2 37 23.65	1.8922	9 56 11.2	9.552
6	2 39 17.24	1.8941	10 5 43.2	9.512
7	2 41 10.94	1.8960	10 15 12.7	9.472
8	2 43 4.76	1.8980	10 24 39.8	9.431
9	2 44 58.70	1.9000	10 34 4.4	9.389
10	2 46 52.76	1.9020	10 43 26.5	9.347
11	2 48 46.94	1.9041	10 52 46.0	9.304
12	2 50 41.25	1.9062	11 2 2.9	9.260
13	2 52 35.69	1.9084	11 11 17.2	9.216
14	2 54 30.26	1.9107	11 20 28.8	9.171
15	2 56 24.97	1.9129	11 29 37.7	9.125
16	2 58 19.81	1.9151	11 38 43.8	9.079
17	3 0 14.78	1.9174	11 47 47.2	9.033
18	3 2 9.89	1.9198	11 56 47.8	8.986
19	3 4 5.15	1.9223	12 5 45.5	8.938
20	3 6 0.56	1.9247	12 14 40.3	8.889
21	3 7 56.11	1.9271	12 23 32.2	8.840
22	3 9 51.81	1.9297	12 32 21.1	8.790
23	3 11 47.67	1.9322	N. 12 41 7.0	8.740
	WEDNESDAY 4.			
0	3 13 43.68	1.9348	N. 12 49 49.9	8.689
1	3 15 39.85	1.9375	12 58 29.7	8.637
2	3 17 36.18	1.9401	13 7 6.4	8.585
3	3 19 32.66	1.9427	13 15 39.9	8.532
4	3 21 29.30	1.9454	13 24 10.2	8.478
5	3 23 26.11	1.9483	13 32 37.3	8.425
6	3 25 23.09	1.9511	13 41 1.2	8.371
7	3 27 20.24	1.9539	13 49 21.8	8.315
8	3 29 17.56	1.9567	13 57 39.0	8.259
9	3 31 15.04	1.9595	14 5 52.8	8.202
10	3 33 12.70	1.9624	14 14 3.2	8.144
11	3 35 10.53	1.9653	14 22 10.1	8.087
12	3 37 8.54	1.9683	14 30 13.6	8.028
13	3 39 6.73	1.9713	14 38 13.5	7.968
14	3 41 5.10	1.9743	14 46 9.8	7.909
15	3 43 3.65	1.9773	14 54 2.6	7.849
16	3 45 2.38	1.9804	15 1 51.7	7.787
17	3 47 1.30	1.9836	15 9 37.0	7.724
18	3 49 0.41	1.9867	15 17 18.6	7.662
19	3 50 59.71	1.9898	15 24 56.5	7.599
20	3 52 59.19	1.9929	15 32 30.5	7.535
21	3 54 58.86	1.9961	15 40 0.7	7.471
22	3 56 58.72	1.9993	15 47 27.0	7.406
23	3 58 58.78	2.0026	15 54 49.4	7.340
24	4 0 59.03	2.0058	N. 16 2 7.8	7.273

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	THURSDAY 5.			
	h m s	s	° ′ ″	″
0	4 0 59.03	2.0058	N.16 2 7.8	7.273
1	4 2 59.47	2.0090	16 9 22.2	7.206
2	4 5 0.11	2.0123	16 16 32.5	7.138
3	4 7 0.95	2.0156	16 23 38.8	7.070
4	4 9 1.99	2.0189	16 30 40.9	7.000
5	4 11 3.22	2.0222	16 37 38.8	6.930
6	4 13 4.65	2.0256	16 44 32.5	6.860
7	4 15 6.29	2.0289	16 51 22.0	6.789
8	4 17 8.12	2.0322	16 58 7.2	6.716
9	4 19 10.15	2.0355	17 4 48.0	6.643
10	4 21 12.38	2.0389	17 11 24.4	6.570
11	4 23 14.82	2.0423	17 17 56.4	6.497
12	4 25 17.46	2.0457	17 24 24.0	6.422
13	4 27 20.31	2.0491	17 30 47.1	6.347
14	4 29 23.36	2.0525	17 37 5.6	6.271
15	4 31 26.61	2.0559	17 43 19.6	6.195
16	4 33 30.07	2.0593	17 49 29.0	6.117
17	4 35 33.73	2.0627	17 55 33.7	6.038
18	4 37 37.60	2.0662	18 1 33.6	5.959
19	4 39 41.67	2.0696	18 7 28.8	5.881
20	4 41 45.95	2.0730	18 13 19.3	5.802
21	4 43 50.43	2.0764	18 19 5.0	5.721
22	4 45 55.12	2.0798	18 24 45.8	5.639
23	4 48 0.01	2.0832	N.18 30 21.7	5.557
	FRIDAY 6.			
0	4 50 5.10	2.0866	N.18 35 52.6	5.474
1	4 52 10.40	2.0900	18 41 18.6	5.391
2	4 54 15.90	2.0934	18 46 39.5	5.307
3	4 56 21.61	2.0968	18 51 55.4	5.222
4	4 58 27.52	2.1002	18 57 6.2	5.137
5	5 0 33.63	2.1035	19 2 11.9	5.052
6	5 2 39.94	2.1068	19 7 12.4	4.965
7	5 4 46.45	2.1102	19 12 7.7	4.877
8	5 6 53.16	2.1136	19 16 57.7	4.789
9	5 9 0.08	2.1169	19 21 42.4	4.701
10	5 11 7.19	2.1202	19 26 21.8	4.612
11	5 13 14.50	2.1235	19 30 55.9	4.523
12	5 15 22.01	2.1267	19 35 24.6	4.432
13	5 17 29.71	2.1300	19 39 47.8	4.341
14	5 19 37.61	2.1332	19 44 5.5	4.249
15	5 21 45.70	2.1364	19 48 17.7	4.157
16	5 23 53.98	2.1396	19 52 24.4	4.065
17	5 26 2.45	2.1429	19 56 25.5	3.971
18	5 28 11.12	2.1461	20 0 20.9	3.877
19	5 30 19.98	2.1492	20 4 10.7	3.782
20	5 32 29.02	2.1522	20 7 54.8	3.687
21	5 34 38.24	2.1552	20 11 33.2	3.592
22	5 36 47.65	2.1583	20 15 5.8	3.495
23	5 38 57.24	2.1613	20 18 32.6	3.398
24	5 41 7.01	2.1643	N.20 21 53.6	3.301

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY 7.			
	h m s	s	° ′ ″	″
0	5 41 7.01	2.1643	N.20 21 53.6	3.301
1	5 43 16.96	2.1672	20 25 8.7	3.203
2	5 45 27.08	2.1702	20 28 17.9	3.104
3	5 47 37.38	2.1731	20 31 21.2	3.006
4	5 49 47.85	2.1760	20 34 18.6	2.906
5	5 51 58.50	2.1789	20 37 9.9	2.805
6	5 54 9.32	2.1817	20 39 55.2	2.704
7	5 56 20.30	2.1844	20 42 34.4	2.603
8	5 58 31.44	2.1871	20 45 7.6	2.502
9	6 0 42.75	2.1898	20 47 34.7	2.400
10	6 2 54.22	2.1924	20 49 55.6	2.297
11	6 5 5.84	2.1950	20 52 10.3	2.194
12	6 7 17.62	2.1976	20 54 18.9	2.091
13	6 9 29.56	2.2002	20 56 21.2	1.987
14	6 11 41.64	2.2026	20 58 17.3	1.882
15	6 13 53.87	2.2050	21 0 7.1	1.777
16	6 16 6.24	2.2074	21 1 50.6	1.672
17	6 18 18.76	2.2098	21 3 27.7	1.566
18	6 20 31.42	2.2122	21 4 58.5	1.460
19	6 22 44.22	2.2144	21 6 22.9	1.353
20	6 24 57.15	2.2166	21 7 40.9	1.246
21	6 27 10.21	2.2187	21 8 52.5	1.139
22	6 29 23.40	2.2209	21 9 57.6	1.031
23	6 31 36.72	2.2230	N.21 10 56.2	0.924
	SUNDAY 8.			
0	6 33 50.16	2.2250	N.21 11 48.4	0.816
1	6 36 3.72	2.2270	21 12 34.1	0.707
2	6 38 17.40	2.2289	21 13 13.2	0.597
3	6 40 31.19	2.2307	21 13 45.8	0.488
4	6 42 45.09	2.2326	21 14 11.8	0.378
5	6 44 59.10	2.2344	21 14 31.2	0.268
6	6 47 13.22	2.2362	21 14 44.0	0.158
7	6 49 27.44	2.2378	21 14 50.2	+ 0.047
8	6 51 41.76	2.2394	21 14 49.7	− 0.063
9	6 53 56.17	2.2409	21 14 42.6	0.174
10	6 56 10.67	2.2424	21 14 28.8	0.285
11	6 58 25.26	2.2439	21 14 8.4	0.396
12	7 0 39.94	2.2453	21 13 41.3	0.507
13	7 2 54.70	2.2467	21 13 7.5	0.619
14	7 5 9.54	2.2480	21 12 27.0	0.732
15	7 7 24.46	2.2492	21 11 39.7	0.844
16	7 9 39.45	2.2504	21 10 45.7	0.956
17	7 11 54.51	2.2515	21 9 45.0	1.068
18	7 14 9.63	2.2526	21 8 37.5	1.181
19	7 16 24.82	2.2537	21 7 23.3	1.293
20	7 18 40.07	2.2546	21 6 2.3	1.406
21	7 20 55.37	2.2554	21 4 34.6	1.518
22	7 23 10.72	2.2563	21 3 0.1	1.631
23	7 25 26.12	2.2571	21 1 18.9	1.744
24	7 27 41.57	2.2578	N.20 59 30.9	1.857

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

MONDAY 9.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	7 27 41.57	2.2578	N.20 59 30.9	1.857
1	7 29 57.06	2.2585	20 57 36.1	1.969
2	7 32 12.59	2.2592	20 55 34.6	2.082
3	7 34 28.16	2.2597	20 53 26.3	2.195
4	7 36 43.76	2.2602	20 51 11.2	2.308
5	7 38 59.39	2.2607	20 48 49.3	2.421
6	7 41 15.05	2.2612	20 46 20.7	2.533
7	7 43 30.73	2.2615	20 43 45.3	2.646
8	7 45 46.43	2.2618	20 41 3.2	2.758
9	7 48 2.14	2.2620	20 38 14.3	2.871
10	7 50 17.87	2.2622	20 35 18.6	2.984
11	7 52 33.60	2.2623	20 32 16.2	3.096
12	7 54 49.34	2.2624	20 29 7.1	3.209
13	7 57 5.09	2.2624	20 25 51.2	3.321
14	7 59 20.83	2.2623	20 22 28.6	3.432
15	8 1 36.57	2.2623	20 18 59.4	3.543
16	8 3 52.31	2.2622	20 15 23.5	3.654
17	8 6 8.04	2.2621	20 11 40.9	3.766
18	8 8 23.76	2.2618	20 7 51.6	3.877
19	8 10 39.46	2.2615	20 3 55.7	3.987
20	8 12 55.14	2.2612	19 59 53.1	4.098
21	8 15 10.81	2.2609	19 55 43.9	4.208
22	8 17 26.45	2.2605	19 51 28.1	4.318
23	8 19 42.07	2.2601	N.19 47 5.7	4.428

TUESDAY 10.

0	8 21 57.66	2.2595	N.19 42 36.7	4.537
1	8 24 13.21	2.2589	19 38 1.2	4.647
2	8 26 28.73	2.2584	19 33 19.1	4.756
3	8 28 44.22	2.2578	19 28 30.5	4.864
4	8 30 59.67	2.2571	19 23 35.4	4.972
5	8 33 15.07	2.2563	19 18 33.8	5.080
6	8 35 30.43	2.2556	19 13 25.8	5.187
7	8 37 45.74	2.2548	19 8 11.3	5.294
8	8 40 1.00	2.2539	19 2 50.5	5.400
9	8 42 16.21	2.2531	18 57 23.3	5.507
10	8 44 31.37	2.2522	18 51 49.7	5.613
11	8 46 46.47	2.2512	18 46 9.8	5.718
12	8 49 1.51	2.2502	18 40 23.6	5.823
13	8 51 16.49	2.2492	18 34 31.1	5.927
14	8 53 31.41	2.2482	18 28 32.4	6.030
15	8 55 46.27	2.2471	18 22 27.5	6.132
16	8 58 1.06	2.2459	18 16 16.5	6.235
17	9 0 15.78	2.2448	18 9 59.3	6.338
18	9 2 30.43	2.2436	18 3 35.9	6.441
19	9 4 45.01	2.2423	17 57 6.4	6.542
20	9 6 59.51	2.2411	17 50 30.9	6.642
21	9 9 13.94	2.2398	17 43 49.4	6.742
22	9 11 28.29	2.2386	17 37 1.9	6.841
23	9 13 42.57	2.2373	17 30 8.5	6.940
24	9 15 56.77	2.2360	N.17 23 9.1	7.038

WEDNESDAY 11.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	9 15 56.77	2.2360	N.17 23 9.1	7.038
1	9 18 10.89	2.2346	17 16 3.9	7.136
2	9 20 24.92	2.2332	17 8 52.8	7.233
3	9 22 38.87	2.2318	17 1 35.9	7.330
4	9 24 52.74	2.2304	16 54 13.2	7.426
5	9 27 6.52	2.2289	16 46 44.8	7.521
6	9 29 20.21	2.2274	16 39 10.7	7.615
7	9 31 33.81	2.2260	16 31 31.0	7.709
8	9 33 47.33	2.2246	16 23 45.6	7.803
9	9 36 0.76	2.2231	16 15 54.6	7.896
10	9 38 14.10	2.2216	16 7 58.1	7.987
11	9 40 27.35	2.2201	15 59 56.2	8.077
12	9 42 40.51	2.2186	15 51 48.8	8.168
13	9 44 53.58	2.2170	15 43 36.0	8.258
14	9 47 6.55	2.2154	15 35 17.8	8.346
15	9 49 19.43	2.2139	15 26 54.4	8.434
16	9 51 32.22	2.2124	15 18 25.7	8.522
17	9 53 44.92	2.2108	15 9 51.7	8.610
18	9 55 57.52	2.2092	15 1 12.5	8.696
19	9 58 10.03	2.2077	14 52 28.2	8.781
20	10 0 22.45	2.2062	14 43 38.8	8.865
21	10 2 34.77	2.2046	14 34 44.4	8.948
22	10 4 47.00	2.2031	14 25 45.0	9.031
23	10 6 59.14	2.2016	N.14 16 40.6	9.113

THURSDAY 12.

0	10 9 11.19	2.2000	N.14 7 31.4	9.194
1	10 11 23.14	2.1984	13 58 17.3	9.275
2	10 13 35.00	2.1969	13 48 58.4	9.355
3	10 15 46.77	2.1954	13 39 34.7	9.434
4	10 17 58.45	2.1939	13 30 6.3	9.512
5	10 20 10.04	2.1924	13 20 33.3	9.589
6	10 22 21.54	2.1909	13 10 55.7	9.665
7	10 24 32.95	2.1894	13 1 13.5	9.741
8	10 26 44.27	2.1880	12 51 26.8	9.815
9	10 28 55.51	2.1866	12 41 35.7	9.888
10	10 31 6.66	2.1851	12 31 40.2	9.961
11	10 33 17.72	2.1836	12 21 40.3	10.033
12	10 35 28.69	2.1822	12 11 36.2	10.104
13	10 37 39.58	2.1808	12 1 27.8	10.175
14	10 39 50.39	2.1794	11 51 15.2	10.244
15	10 42 1.11	2.1781	11 40 58.5	10.312
16	10 44 11.76	2.1768	11 30 37.7	10.380
17	10 46 22.33	2.1755	11 20 12.9	10.447
18	10 48 32.82	2.1742	11 9 44.1	10.513
19	10 50 43.23	2.1729	10 59 11.4	10.578
20	10 52 53.57	2.1717	10 48 34.8	10.642
21	10 55 3.84	2.1705	10 37 54.4	10.704
22	10 57 14.03	2.1693	10 27 10.3	10.766
23	10 59 24.15	2.1682	10 16 22.5	10.827
24	11 1 34.21	2.1671	N.10 5 31.1	10.887

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	FRIDAY 13.			
	h m s	s	° ′ ″	″
0	11 1 34.21	2.1671	N. 10 5 31.1	10.887
1	11 3 44.20	2.1659	9 54 36.1	10.947
2	11 5 54.12	2.1648	9 43 37.5	11.005
3	11 8 3.98	2.1638	9 32 35.5	11.062
4	11 10 13.78	2.1628	9 21 30.1	11.118
5	11 12 23.52	2.1619	9 10 21.3	11.174
6	11 14 33.21	2.1610	8 59 9.2	11.228
7	11 16 42.84	2.1601	8 47 53.9	11.282
8	11 18 52.42	2.1592	8 36 35.4	11.334
9	11 21 1.94	2.1584	8 25 13.8	11.386
10	11 23 11.42	2.1576	8 13 49.1	11.437
11	11 25 20.85	2.1568	8 2 21.4	11.486
12	11 27 30.23	2.1560	7 50 50.8	11.534
13	11 29 39.57	2.1554	7 39 17.3	11.582
14	11 31 48.88	2.1548	7 27 41.0	11.628
15	11 33 58.15	2.1542	7 16 1.9	11.674
16	11 36 7.39	2.1537	7 4 20.1	11.719
17	11 38 16.59	2.1531	6 52 35.6	11.762
18	11 40 25.76	2.1526	6 40 48.6	11.804
19	11 42 34.90	2.1522	6 28 59.1	11.846
20	11 44 44.02	2.1518	6 17 7.1	11.887
21	11 46 53.12	2.1515	6 5 12.6	11.927
22	11 49 2.20	2.1512	5 53 15.8	11.965
23	11 51 11.27	2.1510	N. 5 41 16.8	12.002
	SATURDAY 14.			
0	11 53 20.32	2.1508	N. 5 29 15.6	12.038
1	11 55 29.36	2.1506	5 17 12.2	12.074
2	11 57 38.39	2.1505	5 5 6.7	12.108
3	11 59 47.42	2.1504	4 52 59.2	12.142
4	12 1 56.44	2.1504	4 40 49.7	12.174
5	12 4 5.47	2.1505	4 28 38.3	12.205
6	12 6 14.50	2.1505	4 16 25.1	12.235
7	12 8 23.53	2.1506	4 4 10.1	12.264
8	12 10 32.57	2.1508	3 51 53.4	12.292
9	12 12 41.63	2.1511	3 39 35.1	12.319
10	12 14 50.71	2.1515	3 27 15.2	12.345
11	12 16 59.81	2.1518	3 14 53.7	12.371
12	12 19 8.93	2.1522	3 2 30.7	12.394
13	12 21 18.07	2.1526	2 50 6.4	12.416
14	12 23 27.24	2.1531	2 37 40.8	12.437
15	12 25 36.44	2.1537	2 25 13.9	12.458
16	12 27 45.68	2.1542	2 12 45.8	12.477
17	12 29 54.95	2.1548	2 0 16.6	12.496
18	12 32 4.26	2.1556	1 47 46.3	12.513
19	12 34 13.62	2.1564	1 35 15.0	12.529
20	12 36 23.03	2.1572	1 22 42.8	12.544
21	12 38 32.49	2.1581	1 10 9.7	12.558
22	12 40 42.00	2.1589	0 57 35.8	12.571
23	12 42 51.56	2.1598	0 45 1.2	12.582
24	12 45 1.18	2.1609	N. 0 32 25.9	12.593

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SUNDAY 15.			
	h m s	s	° ′ ″	″
0	12 45 1.18	2.1609	N. 0 32 25.9	12.593
1	12 47 10.87	2.1621	0 19 50.0	12.602
2	12 49 20.63	2.1632	N. 0 7 13.6	12.611
3	12 51 30.46	2.1644	S. 0 5 23.3	12.618
4	12 53 40.36	2.1657	0 18 0.6	12.624
5	12 55 50.34	2.1670	0 30 38.2	12.628
6	12 58 0.40	2.1684	0 43 16.0	12.632
7	13 0 10.55	2.1698	0 55 54.0	12.634
8	13 2 20.78	2.1712	1 8 32.1	12.636
9	13 4 31.10	2.1728	1 21 10.3	12.637
10	13 6 41.52	2.1744	1 33 48.5	12.636
11	13 8 52.03	2.1760	1 46 26.6	12.633
12	13 11 2.64	2.1778	1 59 4.5	12.630
13	13 13 13.36	2.1796	2 11 42.2	12.626
14	13 15 24.19	2.1814	2 24 19.6	12.620
15	13 17 35.13	2.1832	2 36 56.6	12.613
16	13 19 46.18	2.1851	2 49 33.2	12.605
17	13 21 57.34	2.1870	3 2 9.2	12.595
18	13 24 8.62	2.1891	3 14 44.6	12.585
19	13 26 20.03	2.1912	3 27 19.4	12.573
20	13 28 31.57	2.1934	3 39 53.4	12.560
21	13 30 43.24	2.1957	3 52 26.6	12.546
22	13 32 55.05	2.1979	4 4 58.9	12.531
23	13 35 6.99	2.2002	S. 4 17 30.3	12.515
	MONDAY 16.			
0	13 37 19.07	2.2026	S. 4 30 0.7	12.497
1	13 39 31.30	2.2050	4 42 30.0	12.478
2	13 41 43.67	2.2074	4 54 58.1	12.457
3	13 43 56.19	2.2100	5 7 24.9	12.436
4	13 46 8.87	2.2126	5 19 50.4	12.413
5	13 48 21.70	2.2152	5 32 14.5	12.389
6	13 50 34.69	2.2179	5 44 37.1	12.364
7	13 52 47.85	2.2207	5 56 58.2	12.337
8	13 55 1.17	2.2234	6 9 17.6	12.309
9	13 57 14.66	2.2263	6 21 35.3	12.281
10	13 59 28.32	2.2292	6 33 51.3	12.251
11	14 1 42.16	2.2321	6 46 5.4	12.218
12	14 3 56.17	2.2351	6 58 17.5	12.185
13	14 6 10.37	2.2382	7 10 27.6	12.152
14	14 8 24.75	2.2412	7 22 35.7	12.117
15	14 10 39.31	2.2443	7 34 41.6	12.080
16	14 12 54.06	2.2475	7 46 45.3	12.042
17	14 15 9.01	2.2507	7 58 46.6	12.002
18	14 17 24.15	2.2540	8 10 45.5	11.962
19	14 19 39.49	2.2573	8 22 42.0	11.920
20	14 21 55.03	2.2607	8 34 35.9	11.876
21	14 24 10.77	2.2641	8 46 27.1	11.831
22	14 26 26.72	2.2675	8 58 15.6	11.785
23	14 28 42.87	2.2709	9 10 1.3	11.738
24	14 30 59.23	2.2745	S. 9 21 44.2	11.690

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	TUESDAY 17.			
	h m s	s	° ′ ″	″
0	14 30 59.23	2.2745	S. 9 21 44.2	11.690
1	14 33 15.81	2.2781	9 33 24.1	11.640
2	14 35 32.60	2.2817	9 45 1.0	11.588
3	14 37 49.61	2.2853	9 56 34.7	11.535
4	14 40 6.84	2.2890	10 8 5.2	11.482
5	14 42 24.29	2.2927	10 19 32.5	11.427
6	14 44 41.96	2.2964	10 30 56.5	11.371
7	14 46 59.86	2.3002	10 42 17.0	11.312
8	14 49 17.99	2.3040	10 53 33.9	11.252
9	14 51 36.34	2.3078	11 4 47.3	11.192
10	14 53 54.92	2.3117	11 15 57.0	11.130
11	14 56 13.74	2.3156	11 27 2.9	11.067
12	14 58 32.79	2.3195	11 38 5.0	11.003
13	15 0 52.08	2.3234	11 49 3.2	10.937
14	15 3 11.60	2.3273	11 59 57.4	10.868
15	15 5 31.36	2.3313	12 10 47.4	10.799
16	15 7 51.36	2.3354	12 21 33.3	10.730
17	15 10 11.61	2.3395	12 32 15.0	10.658
18	15 12 32.10	2.3435	12 42 52.3	10.585
19	15 14 52.83	2.3476	12 53 25.2	10.511
20	15 17 13.81	2.3517	13 3 53.6	10.436
21	15 19 35.03	2.3557	13 14 17.5	10.359
22	15 21 56.50	2.3598	13 24 36.7	10.281
23	15 24 18.21	2.3639	S. 13 34 51.2	10.201
	WEDNESDAY 18.			
0	15 26 40.17	2.3681	S. 13 45 0.8	10.119
1	15 29 2.38	2.3722	13 55 5.5	10.037
2	15 31 24.84	2.3764	14 5 5.3	9.954
3	15 33 47.55	2.3805	14 15 0.0	9.868
4	15 36 10.50	2.3846	14 24 49.5	9.782
5	15 38 33.70	2.3887	14 34 33.9	9.696
6	15 40 57.15	2.3929	14 44 13.0	9.607
7	15 43 20.85	2.3971	14 53 46.7	9.516
8	15 45 44.80	2.4012	15 3 14.9	9.423
9	15 48 9.00	2.4054	15 12 37.5	9.330
10	15 50 33.45	2.4095	15 21 54.5	9.237
11	15 52 58.14	2.4136	15 31 5.9	9.142
12	15 55 23.08	2.4177	15 40 11.5	9.045
13	15 57 48.27	2.4218	15 49 11.3	8.947
14	16 0 13.70	2.4258	15 58 5.1	8.847
15	16 2 39.37	2.4298	16 6 52.9	8.746
16	16 5 5.28	2.4339	16 15 34.6	8.644
17	16 7 31.44	2.4380	16 24 10.2	8.541
18	16 9 57.84	2.4420	16 32 39.5	8.436
19	16 12 24.48	2.4459	16 41 2.5	8.331
20	16 14 51.35	2.4498	16 49 19.2	8.224
21	16 17 18.46	2.4537	16 57 29.4	8.115
22	16 19 45.80	2.4576	17 5 33.0	8.006
23	16 22 13.37	2.4615	17 13 30.1	7.896
24	16 24 41.18	2.4654	S. 17 21 20.5	7.784

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	THURSDAY 19.			
	h m s	s	° ′ ″	″
0	16 24 41.18	2.4654	S. 17 21 20.5	7.784
1	16 27 9.22	2.4691	17 29 4.1	7.671
2	16 29 37.47	2.4727	17 36 41.0	7.557
3	16 32 5.94	2.4763	17 44 11.0	7.442
4	16 34 34.63	2.4800	17 51 34.0	7.325
5	16 37 3.54	2.4837	17 58 50.0	7.208
6	16 39 32.67	2.4873	18 5 59.0	7.090
7	16 42 2.01	2.4907	18 13 0.8	6.970
8	16 44 31.55	2.4941	18 19 55.4	6.849
9	16 47 1.30	2.4975	18 26 42.7	6.727
10	16 49 31.25	2.5008	18 33 22.7	6.605
11	16 52 1.39	2.5040	18 39 55.3	6.481
12	16 54 31.73	2.5072	18 46 20.4	6.356
13	16 57 2.26	2.5103	18 52 38.0	6.230
14	16 59 32.97	2.5133	18 58 48.0	6.103
15	17 2 3.86	2.5163	19 4 50.4	5.976
16	17 4 34.93	2.5193	19 10 45.1	5.847
17	17 7 6.18	2.5222	19 16 32.0	5.717
18	17 9 37.60	2.5250	19 22 11.2	5.587
19	17 12 9.18	2.5277	19 27 42.5	5.456
20	17 14 40.92	2.5303	19 33 5.9	5.324
21	17 17 12.81	2.5328	19 38 21.3	5.191
22	17 19 44.86	2.5353	19 43 28.8	5.057
23	17 22 17.05	2.5377	S. 19 48 28.2	4.922
	FRIDAY 20.			
0	17 24 49.38	2.5399	S. 19 53 19.5	4.787
1	17 27 21.84	2.5421	19 58 2.6	4.651
2	17 29 54.44	2.5443	20 2 37.6	4.515
3	17 32 27.16	2.5463	20 7 4.4	4.377
4	17 35 0.00	2.5482	20 11 22.9	4.239
5	17 37 32.95	2.5501	20 15 33.1	4.100
6	17 40 6.01	2.5518	20 19 34.9	3.961
7	17 42 39.17	2.5535	20 23 28.4	3.822
8	17 45 12.43	2.5551	20 27 13.5	3.681
9	17 47 45.78	2.5565	20 30 50.1	3.540
10	17 50 19.21	2.5578	20 34 18.3	3.399
11	17 52 52.72	2.5591	20 37 38.0	3.257
12	17 55 26.31	2.5603	20 40 49.1	3.114
13	17 57 59.96	2.5613	20 43 51.7	2.971
14	18 0 33.67	2.5622	20 46 45.7	2.828
15	18 3 7.43	2.5631	20 49 31.1	2.685
16	18 5 41.24	2.5638	20 52 7.9	2.542
17	18 8 15.09	2.5645	20 54 36.1	2.398
18	18 10 48.98	2.5650	20 56 55.6	2.253
19	18 13 22.89	2.5654	20 59 6.4	2.108
20	18 15 56.82	2.5657	21 1 8.5	1.963
21	18 18 30.77	2.5658	21 3 2.0	1.819
22	18 21 4.72	2.5659	21 4 46.8	1.673
23	18 23 38.68	2.5659	21 6 22.8	1.527
24	18 26 12.63	2.5657	S. 21 7 50.1	1.382

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY 21.			
	h m s	s	° ′ ″	″
0	18 26 12.63	2.5657	S. 21 7 50.1	1.382
1	18 28 46.57	2.5655	21 9 8.7	1.237
2	18 31 20.49	2.5651	21 10 18.6	1.092
3	18 33 54.38	2.5646	21 11 19.7	0.946
4	18 36 28.24	2.5640	21 12 12.1	0.801
5	18 39 2.06	2.5634	21 12 55.8	0.655
6	18 41 35.84	2.5626	21 13 30.7	0.509
7	18 44 9.57	2.5616	21 13 56.9	0.365
8	18 46 43.23	2.5604	21 14 14.5	0.221
9	18 49 16.82	2.5592	21 14 23.4	− 0.076
10	18 51 50.34	2.5581	21 14 23.6	+ 0.069
11	18 54 23.79	2.5568	21 14 15.1	0.214
12	18 56 57.15	2.5553	21 13 57.9	0.358
13	18 59 30.42	2.5536	21 13 32.1	0.502
14	19 2 3.58	2.5518	21 12 57.7	0.646
15	19 4 36.63	2.5499	21 12 14.6	0.789
16	19 7 9.57	2.5481	21 11 23.0	0.932
17	19 9 42.40	2.5461	21 10 22.8	1.074
18	19 12 15.10	2.5439	21 9 14.1	1.216
19	19 14 47.66	2.5416	21 7 56.9	1.357
20	19 17 20.09	2.5392	21 6 31.2	1.499
21	19 19 52.37	2.5367	21 4 57.0	1.640
22	19 22 24.50	2.5342	21 3 14.4	1.780
23	19 24 56.47	2.5315	S. 21 1 23.4	1.919
	SUNDAY 22.			
0	19 27 28.28	2.5287	S. 20 59 24.1	2.057
1	19 29 59.92	2.5258	20 57 16.5	2.196
2	19 32 31.38	2.5228	20 55 0.6	2.334
3	19 35 2.65	2.5197	20 52 36.4	2.472
4	19 37 33.74	2.5166	20 50 4.0	2.608
5	19 40 4.64	2.5132	20 47 23.5	2.743
6	19 42 35.33	2.5098	20 44 34.9	2.878
7	19 45 5.82	2.5064	20 41 38.2	3.012
8	19 47 36.10	2.5029	20 38 33.5	3.145
9	19 50 6.17	2.4993	20 35 20.8	3.277
10	19 52 36.02	2.4956	20 32 0.2	3.409
11	19 55 5.64	2.4917	20 28 31.7	3.540
12	19 57 35.02	2.4877	20 24 55.4	3.670
13	20 0 4.17	2.4838	20 21 11.3	3.799
14	20 2 33.08	2.4798	20 17 19.5	3.927
15	20 5 1.75	2.4757	20 13 20.0	4.055
16	20 7 30.16	2.4714	20 9 12.9	4.181
17	20 9 58.32	2.4671	20 4 58.3	4.306
18	20 12 26.22	2.4628	20 0 36.2	4.431
19	20 14 53.86	2.4584	19 56 6.6	4.555
20	20 17 21.23	2 4539	19 51 29.6	4.677
21	20 19 48.33	2.4493	19 46 45.4	4.798
22	20 22 15.15	2.4447	19 41 53.9	4.918
23	20 24 41.69	2.4400	19 36 55.2	5.037
24	20 27 7.95	2.4352	S. 19 31 49.4	5.155

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	MONDAY 23.			
	h m s	s	° ′ ″	″
0	20 27 7.95	2.4352	S. 19 31 49.4	5.155
1	20 29 33.92	2.4304	19 26 36.6	5.272
2	20 31 59.60	2.4256	19 21 16.8	5.388
3	20 34 24.99	2.4207	19 15 50.0	5.504
4	20 36 50.08	2.4157	19 10 16.3	5.618
5	20 39 14.87	2.4107	19 4 35.8	5.731
6	20 41 39.36	2.4056	18 58 48.6	5.842
7	20 44 3.54	2.4004	18 52 54.7	5.952
8	20 46 27.41	2.3953	18 46 54.3	6.061
9	20 48 50.98	2.3901	18 40 47.4	6.169
10	20 51 14.23	2.3848	18 34 34.0	6.276
11	20 53 37.16	2.3795	18 28 14.3	6.381
12	20 55 59.77	2.3742	18 21 48.3	6.486
13	20 58 22.06	2.3688	18 15 16.0	6.589
14	21 0 44.03	2.3635	18 8 37.6	6.691
15	21 3 5.68	2.3581	18 1 53.1	6.792
16	21 5 27.00	2.3526	17 55 2.5	6.892
17	21 7 47.99	2.3472	17 48 6.0	6.990
18	21 10 8.66	2.3417	17 41 3.7	7.087
19	21 12 29·00	2.3362	17 33 55.6	7.183
20	21 14 49.00	2.3306	17 26 41.7	7.278
21	21 17 8.67	2.3250	17 19 22.2	7.372
22	21 19 28.00	2.3194	17 11 57.1	7.464
23	21 21 47.00	2.3139	S. 17 4 26.5	7.555
	TUESDAY 24.			
0	21 24 5.67	2.3083	S. 16 56 50.5	7.644
1	21 26 24.00	2.3027	16 49 9.2	7.732
2	21 28 41.99	2.2971	16 41 22.6	7.820
3	21 30 59.65	2.2915	16 33 30.8	7.906
4	21 33 16.97	2.2858	16 25 33.9	7.991
5	21 35 33.95	2.2802	16 17 31.9	8.074
6	21 37 50.59	2.2745	16 9 25.0	8.156
7	21 40 6.89	2.2689	16 1 13.2	8.237
8	21 42 22.86	2.2633	15 52 56.6	8.317
9	21 44 38.49	2.2577	15 44 35.2	8.395
10	21 46 53.78	2.2520	15 36 9.2	8.472
11	21 49 8.73	2.2464	15 27 38.6	8.548
12	21 51 23.35	2.2408	15 19 3.4	8.623
13	21 53 37.63	2.2352	15 10 23.8	8.697
14	21 55 51.58	2.2297	15 1 39.8	8.768
15	21 58 5.19	2.2241	14 52 51.6	8.838
16	22 0 18.47	2.2185	14 43 59.2	8.908
17	22 2 31.41	2.2129	14 35 2.6	8.977
18	22 4 44.02	2.2074	14 26 1.9	9.045
19	22 6 56.30	2.2019	14 16 57.2	9 111
20	22 9 8.25	2.1964	14 7 48.6	9.175
21	22 11 19.87	2.1910	13 58 36.2	9.238
22	22 13 31.17	2.1856	13 49 20.0	9.301
23	22 15 42.14	2.1801	13 40 0.1	9.362
24	22 17 52.78	2.1747	S. 13 30 36.5	9.422

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	WEDNESDAY 25.			
	h m s	s	° ′ ″	″
0	22 17 52.78	2.1747	S. 13 30 36.5	9.422
1	22 20 3.10	2.1693	13 21 9.4	9.481
2	22 22 13.10	2.1640	13 11 38.8	9.539
3	22 24 22.78	2.1587	13 2 4.7	9.596
4	22 26 32.14	2.1534	12 52 27.3	9.651
5	22 28 41.19	2.1482	12 42 46.6	9.705
6	22 30 49.92	2.1429	12 33 2.7	9.758
7	22 32 58.34	2.1377	12 23 15.6	9.810
8	22 35 6.45	2.1326	12 13 25.5	9.860
9	22 37 14.25	2.1274	12 3 32.4	9.910
10	22 39 21.74	2.1223	11 53 36.3	9.958
11	22 41 28.93	2.1173	11 43 37.4	10.005
12	22 43 35.82	2.1123	11 33 35.7	10.052
13	22 45 42.41	2.1073	11 23 31.2	10.097
14	22 47 48.70	2.1024	11 13 24.1	10.140
15	22 49 54.70	2.0975	11 3 14.4	10.183
16	22 52 0.40	2.0927	10 53 2.1	10.226
17	22 54 5.82	2.0879	10 42 47.3	10.267
18	22 56 10.95	2.0831	10 32 30.1	10.306
19	22 58 15.79	2.0783	10 22 10.6	10.344
20	23 0 20.35	2.0737	10 11 48.8	10.382
21	23 2 24.63	2.0691	10 1 24.7	10.419
22	23 4 28.64	2.0645	9 50 58.5	10.454
23	23 6 32.37	2.0599	S. 9 40 30.2	10.488
	THURSDAY 26.			
0	23 8 35.83	2.0554	S. 9 29 59.9	10.522
1	23 10 39.02	2.0510	9 19 27.6	10.554
2	23 12 41.95	2.0467	9 8 53.4	10.586
3	23 14 44.62	2.0423	8 58 17.3	10.617
4	23 16 47.03	2.0380	8 47 39.4	10.646
5	23 18 49.18	2.0337	8 36 59.8	10.674
6	23 20 51.07	2.0295	8 26 18.5	10.702
7	23 22 52.72	2.0254	8 15 35.6	10.728
8	23 24 54.12	2.0213	8 4 51.1	10.754
9	23 26 55.27	2.0172	7 54 5.1	10.778
10	23 28 56.18	2.0132	7 43 17.7	10.802
11	23 30 56.86	2.0093	7 32 28.8	10.826
12	23 32 57.30	2.0054	7 21 38.6	10.847
13	23 34 57.51	2.0016	7 10 47.2	10.868
14	23 36 57.49	1.9978	6 59 54.5	10.888
15	23 38 57.24	1.9940	6 49 0.6	10.907
16	23 40 56.77	1.9904	6 38 5.6	10.926
17	23 42 56.09	1.9868	6 27 9.5	10.943
18	23 44 55.19	1.9832	6 16 12.4	10.960
19	23 46 54.08	1.9797	6 5 14.3	10.976
20	23 48 52.76	1.9762	5 54 15.3	10.990
21	23 50 51.23	1.9729	5 43 15.5	11.003
22	23 52 49.50	1.9696	5 32 14.9	11.017
23	23 54 47.58	1.9663	5 21 13.5	11.030
24	23 56 45.46	1.9631	S. 5 10 11.3	11.042

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	FRIDAY 27.			
	h m s	s	° ′ ″	″
0	23 56 45.46	1.9631	S. 5 10 11.3	11.042
1	23 58 43.15	1.9599	4 59 8.5	11.052
2	0 0 40.65	1.9568	4 48 5.1	11.062
3	0 2 37.96	1.9537	4 37 1.1	11.071
4	0 4 35.09	1.9507	4 25 56.6	11.079
5	0 6 32.04	1.9478	4 14 51.6	11.087
6	0 8 28.82	1.9449	4 3 46.2	11.093
7	0 10 25.43	1.9421	3 52 40.4	11.099
8	0 12 21.87	1.9393	3 41 34.3	11.104
9	0 14 18.14	1.9366	3 30 27.9	11.109
10	0 16 14.26	1.9340	3 19 21.2	11.112
11	0 18 10.22	1.9313	3 8 14.4	11.115
12	0 20 6.02	1.9287	2 57 7.4	11.117
13	0 22 1.67	1.9263	2 46 0.3	11.119
14	0 23 57.18	1.9239	2 34 53.1	11.120
15	0 25 52.54	1.9215	2 23 45.9	11.120
16	0 27 47.76	1.9193	2 12 38.7	11.119
17	0 29 42.85	1.9171	2 1 31.6	11.118
18	0 31 37.81	1.9149	1 50 24.6	11.116
19	0 33 32.63	1.9127	1 39 17.7	11.113
20	0 35 27.33	1.9107	1 28 11.1	11.109
21	0 37 21.91	1.9087	1 17 4.7	11.105
22	0 39 16.37	1.9067	1 5 58.5	11.100
23	0 41 10.71	1.9047	S. 0 54 52.7	11.094
	SATURDAY 28.			
0	0 43 4.94	1.9029	S. 0 43 47.2	11.088
1	0 44 59.06	1.9012	0 32 42.1	11.081
2	0 46 53.08	1.8995	0 21 37.5	11.073
3	0 48 47.00	1.8978	S. 0 10 33.3	11.066
4	0 50 40.82	1.8962	N. 0 0 30.4	11.057
5	0 52 34.54	1.8946	0 11 33.5	11.047
6	0 54 28.17	1.8932	0 22 36.0	11.037
7	0 56 21.72	1.8918	0 33 37.9	11.027
8	0 58 15.19	1.8904	0 44 39.2	11.016
9	1 0 8.57	1.8891	0 55 39.8	11.003
10	1 2 1.88	1.8878	1 6 39.6	10.990
11	1 3 55.11	1.8866	1 17 38.6	10.977
12	1 5 48.27	1.8855	1 28 36.8	10.963
13	1 7 41.37	1.8845	1 39 34.1	10.948
14	1 9 34.41	1.8835	1 50 30.5	10.933
15	1 11 27.39	1.8825	2 1 26.1	10.918
16	1 13 20.31	1.8815	2 12 20.7	10.902
17	1 15 13.17	1.8806	2 23 14.3	10.884
18	1 17 5.98	1.8798	2 34 6.8	10.867
19	1 18 58.75	1.8791	2 44 58.3	10.849
20	1 20 51.48	1.8785	2 55 48.7	10.830
21	1 22 44.17	1.8779	3 6 37.9	10.811
22	1 24 36.83	1.8774	3 17 26.0	10.791
23	1 26 29.46	1.8768	3 28 12.8	10.770
24	1 28 22.05	1.8763	N. 3 38 58.4	10.749

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SUNDAY 29.			
	h m s	s	° ′ ″	″
0	1 28 22.05	1.8763	N. 3 38 58.4	10.749
1	1 30 14.62	1.8760	3 49 42.7	10.728
2	1 32 7.17	1.8757	4 0 25.7	10.706
3	1 33 59.70	1.8754	4 11 7.4	10.683
4	1 35 52.22	1.8751	4 21 47.7	10.660
5	1 37 44.72	1.8749	4 32 26.6	10.636
6	1 39 37.21	1.8748	4 43 4.0	10.611
7	1 41 29.70	1.8748	4 53 39.9	10.586
8	1 43 22.19	1.8748	5 4 14.3	10.561
9	1 45 14.67	1.8748	5 14 47.2	10.535
10	1 47 7.16	1.8749	5 25 18.5	10.508
11	1 48 59.66	1.8751	5 35 48.2	10.481
12	1 50 52.18	1.8754	5 46 16.2	10.453
13	1 52 44.71	1.8757	5 56 42.5	10.424
14	1 54 37.26	1.8760	6 7 7.1	10.396
15	1 56 29.83	1.8763	6 17 30.0	10.367
16	1 58 22.42	1.8767	6 27 51.1	10.336
17	2 0 15.03	1.8771	6 38 10.3	10.305
18	2 2 7.67	1.8777	6 48 27.7	10.274
19	2 4 0.35	1.8783	6 58 43.2	10.243
20	2 5 53.07	1.8790	7 8 56.8	10.211
21	2 7 45.83	1.8797	7 19 8.5	10.178
22	2 9 38.63	1.8804	7 29 18.2	10.144
23	2 11 31.48	1.8812	N. 7 39 25.8	10.110
	MONDAY 30.			
0	2 13 24.38	1.8821	N. 7 49 31.4	10.076
1	2 15 17.33	1.8830	7 59 34.9	10.041
2	2 17 10.34	1.8839	8 9 36.3	10.006
3	2 19 3.40	1.8849	8 19 35.6	9.970
4	2 20 56.53	1.8860	8 29 32.7	9.933
5	2 22 49.72	1.8871	8 39 27.5	9.895
6	2 24 42.98	1.8882	8 49 20.1	9.857
7	2 26 36.31	1.8894	8 59 10.4	9.819
8	2 28 29.71	1.8907	9 8 58.4	9.781
9	2 30 23.19	1.8920	9 18 44.1	9.742
10	2 32 16.75	1.8933	9 28 27.4	9.702
11	2 34 10.39	1.8947	9 38 8.3	9.661
12	2 36 4.11	1.8961	9 47 46.7	9.620
13	2 37 57.92	1.8976	9 57 22.7	9.578
14	2 39 51.83	1.8992	10 6 56.1	9.536
15	2 41 45.83	1.9008	10 16 27.0	9.493
16	2 43 39.92	1.9024	10 25 55.3	9.450
17	2 45 34.11	1.9041	10 35 21.0	9.407
18	2 47 28.41	1.9058	10 44 44.1	9.362
19	2 49 22.81	1.9076	10 54 4.5	9.317
20	2 51 17.32	1.9094	11 3 22.2	9.272
21	2 53 11.94	1.9113	11 12 37.1	9.225
22	2 55 6.67	1.9132	11 21 49.2	9.178
23	2 57 1.52	1.9151	11 30 58.5	9.131
24	2 58 56.48	1.9170	N.11 40 5.0	9.084

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	TUESDAY 31.			
	h m s	s	° ′ ″	″
0	2 58 56.48	1.9170	N.11 40 5.0	9.084
1	3 0 51.56	1.9191	11 49 8.6	9.036
2	3 2 46.77	1.9212	11 58 9.3	8.987
3	3 4 42.10	1.9233	12 7 7.0	8.937
4	3 6 37.56	1.9254	12 16 1.7	8.887
5	3 8 33.15	1.9276	12 24 53.4	8.837
6	3 10 28.88	1.9299	12 33 42.1	8.786
7	3 12 24.74	1.9322	12 42 27.7	8.734
8	3 14 20.74	1.9345	12 51 10.1	8.681
9	3 16 16.88	1.9368	12 59 49.4	8.628
10	3 18 13.16	1.9392	13 8 25.5	8.575
11	3 20 9.59	1.9417	13 16 58.4	8.521
12	3 22 6.16	1.9441	13 25 28.0	8.466
13	3 24 2.88	1.9466	13 33 54.3	8.411
14	3 25 59.76	1.9492	13 42 17.3	8.355
15	3 27 56.79	1.9517	13 50 36.9	8.298
16	3 29 53.97	1.9543	13 58 53.1	8.241
17	3 31 51.31	1.9570	14 7 5.8	8.183
18	3 33 48.81	1.9597	14 15 15.1	8.126
19	3 35 46.47	1.9624	14 23 20.9	8.067
20	3 37 44.30	1.9652	14 31 23.1	8.007
21	3 39 42.29	1.9679	14 39 21.7	7.947
22	3 41 40.45	1.9707	14 47 16.7	7.886
23	3 43 38.78	1.9735	N.14 55 8.0	7.824
	WEDNESDAY, AUGUST 1.			
0	3 45 37.27	1.9764	N.15 2 55.6	7.762

PHASES OF THE MOON.

		d	h	m
●	New Moon. . . July	8	18	16.6
☽	First Quarter	16	0	12.8
○	Full Moon	22	17	45.1
☾	Last Quarter	30	8	29.6

		d	h
☾	Apogee . . . . July	3	12.1
☾	Perigee	19	5.0
☾	Apogee	31	6.0

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	III^h.	P. L. of Diff.	VI^h.	P. L. of Diff.	IX^h.	P. L. of Diff.
1	α Aquilæ	W.	78° 17′ 21″	3623	79° 35′ 30″	3625	80° 53′ 37″	3628	82° 11′ 41″	3630
	Fomalhaut	W.	43 17 59	3508	44 38 14	3490	45 58 49	3473	47 19 43	3459
	α Pegasi	W.	32 32 8	4665	33 33 37	4546	34 36 49	4439	35 41 35	4345
	Aldebaran	E.	54 12 40	3013	52 42 43	3020	51 12 55	3027	49 43 16	3034
	Sun	E.	86 14 53	3371	84 52 3	3379	83 29 23	3387	82 6 52	3394
2	α Aquilæ	W.	88 41 20	3646	89 59 5	3649	91 16 46	3653	92 34 23	3658
	Fomalhaut	W.	54 7 44	3405	55 29 55	3397	56 52 15	3389	58 14 44	3382
	α Pegasi	W.	41 24 12	4008	42 35 44	3959	43 48 4	3916	45 1 8	3875
	Aldebaran	E.	42 16 55	3060	40 47 57	3065	39 19 4	3069	37 50 16	3072
	Sun	E.	75 16 7	3423	73 54 16	3427	72 32 30	3431	71 10 48	3433
3	Fomalhaut	W.	65 9 5	3351	66 32 18	3345	67 55 38	3338	69 19 5	3332
	α Pegasi	W.	51 15 41	3719	52 32 8	3694	53 49 1	3671	55 6 19	3649
	Aldebaran	E.	30 27 3	3081	28 58 30	3082	27 29 58	3082	26 1 26	3082
	Sun	E.	64 22 59	3442	63 1 30	3442	61 40 1	3443	60 18 33	3442
4	Fomalhaut	W.	76 17 56	3306	77 42 1	3300	79 6 13	3294	80 30 32	3288
	α Pegasi	W.	61 38 11	3558	62 57 31	3543	64 17 8	3527	65 37 2	3513
	Sun	E.	53 30 50	3432	52 9 10	3430	50 47 27	3425	49 25 39	3422
5	Fomalhaut	W.	87 33 44	3259	88 58 43	3254	90 23 48	3248	91 49 0	3242
	α Pegasi	W.	72 20 21	3448	73 41 43	3436	75 3 19	3425	76 25 7	3414
	α Arietis	W.	29 4 42	3746	30 20 40	3680	31 37 48	3621	32 56 0	3568
	Sun	E.	42 35 27	3397	41 13 7	3391	39 50 40	3385	38 28 6	3379
6	Fomalhaut	W.	98 56 41	3215	100 22 32	3209	101 48 30	3204	103 14 34	3199
	α Pegasi	W.	83 17 12	3363	84 40 11	3353	86 3 21	3345	87 26 41	3335
	α Arietis	W.	39 39 42	3372	41 2 31	3340	42 25 56	3313	43 49 53	3287
	Sun	E.	31 33 20	3343	30 9 58	3334	28 46 26	3326	27 22 45	3319
10	Sun	W.	14 33 7	3040	16 2 30	3028	17 32 8	3016	19 2 1	3005
	Spica	E.	79 10 3	2731	77 34 4	2722	75 57 54	2713	74 21 32	2705
	Mars	E.	81 20 26	2873	79 47 33	2864	78 14 28	2855	76 41 12	2846
	Jupiter	E.	113 37 22	2693	112 0 33	2684	110 23 31	2675	108 46 17	2665
11	Sun	W.	26 34 48	2953	28 6 0	2943	29 37 24	2933	31 9 1	2923
	Spica	E.	66 16 55	2664	64 39 27	2657	63 1 49	2650	61 24 2	2643
	Mars	E.	68 52 2	2804	67 17 39	2796	65 43 6	2788	64 8 22	2779
	Jupiter	E.	100 37 2	2621	98 58 35	2612	97 19 56	2603	95 41 5	2594
	Antares	E.	112 10 5	2681	110 32 59	2670	108 55 39	2660	107 18 6	2651
12	Sun	W.	38 50 9	2876	40 22 58	2867	41 55 59	2858	43 29 12	2849
	Spica	E.	53 12 42	2609	51 33 59	2604	49 55 9	2599	48 16 12	2593
	Mars	E.	56 12 10	2743	54 36 27	2736	53 0 35	2729	51 24 34	2723
	Jupiter	E.	87 23 55	2553	85 43 55	2544	84 3 43	2536	82 23 20	2529
	Antares	E.	99 7 10	2604	97 28 21	2596	95 49 21	2588	94 10 9	2579
13	Sun	W.	51 18 8	2805	52 52 29	2796	54 27 2	2788	56 1 46	2779
	Regulus	W.	14 42 12	2526	16 22 49	2510	18 3 48	2497	19 45 5	2485
	Spica	E.	39 59 58	2577	38 20 31	2576	36 41 3	2576	35 1 35	2577
	Mars	E.	43 22 30	2695	41 45 44	2692	40 8 53	2688	38 31 57	2684

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^h.	P. L. of Diff.	XVIII^h.	P. L. of Diff.	XXI^h.	P. L. of Diff.
1	α Aquilæ	W.	83° 29′ 43″	3633	84° 47′ 42″	3635	86° 5′ 38″	3638	87° 23′ 31″	3642
	Fomalhaut	W.	48 40 53	3446	50 2 17	3435	51 23 54	3424	52 45 43	3414
	α Pegasi	W.	36 47 46	4262	37 55 14	4187	39 3 52	4121	40 13 33	4062
	Aldebaran	E.	48 13 45	3040	46 44 22	3047	45 15 7	3052	43 45 58	3056
	Sun	E.	80 44 29	3400	79 22 13	3408	78 0 5	3413	76 38 3	3418
2	α Aquilæ	W.	93 51 55	3663	95 9 22	3667	96 26 44	3673	97 44 0	3677
	Fomalhaut	W.	59 37 21	3375	61 0 6	3368	62 22 59	3362	63 45 59	3357
	α Pegasi	W.	46 14 53	3838	47 29 16	3805	48 44 13	3774	49 59 42	3746
	Aldebaran	E.	36 21 32	3074	34 52 51	3077	33 24 13	3078	31 55 37	3080
	Sun	E.	69 49 9	3436	68 27 33	3438	67 6 0	3440	65 44 29	3441
3	Fomalhaut	W.	70 42 39	3327	72 6 19	3322	73 30 5	3317	74 53 57	3311
	α Pegasi	W.	56 24 0	3629	57 42 3	3610	59 0 26	3592	60 19 9	3575
	Aldebaran	E.	24 32 55	3082	23 4 23	3082	21 35 51	3081	20 7 18	3080
	Sun	E.	58 57 4	3440	57 35 33	3439	56 14 1	3438	54 52 27	3435
4	Fomalhaut	W.	81 54 57	3282	83 19 29	3277	84 44 7	3271	86 8 52	3265
	α Pegasi	W.	66 57 12	3499	68 17 37	3486	69 38 17	3472	70 59 12	3460
	Sun	E.	48 3 47	3417	46 41 50	3413	45 19 48	3408	43 57 40	3403
5	Fomalhaut	W.	93 14 19	3236	94 39 45	3231	96 5 17	3225	97 30 56	3220
	α Pegasi	W.	77 47 8	3403	79 9 21	3393	80 31 46	3382	81 54 23	3372
	α Arietis	W.	34 15 9	3521	35 35 10	3479	36 55 58	3439	38 17 30	3404
	Sun	E.	37 5 25	3372	35 42 36	3365	34 19 39	3358	32 56 34	3350
6	Fomalhaut	W.	104 40 44	3195	106 6 59	3190	107 33 20	3186	108 59 46	3183
	α Pegasi	W.	88 50 12	3326	90 13 53	3319	91 37 43	3312	93 1 41	3305
	α Arietis	W.	45 14 20	3262	46 39 16	3238	48 4 40	3216	49 30 30	3195
	Sun	E.	25 58 55	3310	24 34 55	3302	23 10 46	3294	21 46 27	3285
10	Sun	W.	20 32 8	2994	22 2 28	2983	23 33 2	2973	25 3 49	2963
	Spica	E.	72 44 59	2697	71 8 15	2688	69 31 19	2680	67 54 12	2672
	Mars	E.	75 7 44	2838	73 34 5	2829	72 0 15	2821	70 26 14	2812
	Jupiter	E.	107 8 50	2656	105 31 11	2647	103 53 20	2638	102 15 17	2629
11	Sun	W.	32 40 51	2913	34 12 53	2904	35 45 7	2895	37 17 32	2886
	Spica	E.	59 46 5	2636	58 7 59	2629	56 29 43	2621	54 51 17	2615
	Mars	E.	62 33 27	2772	60 58 22	2765	59 23 8	2757	57 47 44	2750
	Jupiter	E.	94 2 2	2585	92 22 47	2577	90 43 21	2569	89 3 44	2561
	Antares	E.	105 40 20	2642	104 2 22	2632	102 24 11	2623	100 45 47	2613
12	Sun	W.	45 2 36	2840	46 36 12	2831	48 9 59	2822	49 43 58	2814
	Spica	E.	46 37 8	2589	44 57 58	2585	43 18 42	2582	41 39 22	2579
	Mars	E.	49 48 25	2717	48 12 8	2711	46 35 43	2705	44 59 10	2700
	Jupiter	E.	80 42 47	2520	79 2 2	2512	77 21 6	2504	75 39 59	2497
	Antares	E.	92 30 45	2571	90 51 10	2562	89 11 23	2554	87 31 25	2547
13	Sun	W.	57 36 41	2771	59 11 47	2763	60 47 4	2754	62 22 32	2745
	Regulus	W.	21 26 39	2475	23 8 28	2465	24 50 31	2455	26 32 48	2445
	Spica	E.	33 22 8	2580	31 42 45	2585	30 3 29	2592	28 24 23	2602
	Mars	E.	36 54 56	2682	35 17 52	2681	33 40 46	2681	32 3 40	2681

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13	JUPITER	E.	73° 58′ 41″	2489	72° 17′ 13″	2482	70° 35′ 34″	2474	68° 53′ 44″	2467
	Antares	E.	85 51 17	2539	84 10 58	2531	82 30 28	2524	80 49 48	2516
14	SUN	W.	63 58 12	2737	65 34 3	2729	67 10 4	2721	68 46 16	2713
	Regulus	W.	28 15 18	2437	29 58 0	2428	31 40 55	2419	33 24 3	2410
	MARS	E.	30 26 35	2684	28 49 33	2688	27 12 37	2695	25 35 50	2704
	JUPITER	E.	60 22 0	2430	58 39 8	2424	56 56 7	2417	55 12 56	2410
	Antares	E.	72 23 55	2481	70 42 15	2475	69 0 26	2469	67 18 29	2463
15	SUN	W.	76 49 58	2672	78 27 15	2665	80 4 42	2657	81 42 19	2649
	Regulus	W.	42 2 36	2371	43 46 52	2364	45 31 19	2356	47 15 57	2348
	JUPITER	E.	46 34 38	2378	44 50 31	2372	43 6 16	2366	41 21 53	2361
	Antares	E.	58 46 43	2436	57 3 59	2431	55 21 9	2428	53 38 14	2424
16	SUN	W.	89 53 0	2612	91 31 38	2606	93 10 25	2599	94 49 22	2591
	Regulus	W.	56 1 46	2313	57 47 27	2307	59 33 17	2300	61 19 17	2294
	JUPITER	E.	32 38 11	2340	30 53 10	2338	29 8 6	2336	27 22 59	2335
	Antares	E.	45 2 36	2415	43 19 22	2415	41 36 9	2417	39 52 58	2419
17	SUN	W.	103 6 26	2559	104 46 17	2553	106 26 16	2548	108 6 23	2543
	Regulus	W.	70 11 35	2263	71 58 29	2258	73 45 31	2252	75 32 41	2247
	α Aquilæ	E.	80 17 12	2871	78 44 16	2873	77 11 23	2876	75 38 34	2882
18	SUN	W.	116 28 44	2519	118 9 31	2515	119 50 24	2511	121 31 22	2507
	Regulus	W.	84 30 21	2225	86 18 12	2220	88 6 9	2217	89 54 11	2214
	Spica	W.	31 15 53	2348	33 0 42	2333	34 45 53	2320	36 31 24	2308
	MARS	W.	25 16 16	2509	26 57 17	2489	28 38 45	2474	30 20 35	2460
	α Aquilæ	E.	67 56 51	2933	66 25 14	2949	64 53 57	2967	63 23 3	2989
	Fomalhaut	E.	100 36 14	2454	98 53 56	2448	97 11 29	2442	95 28 54	2438
19	Regulus	W.	98 55 21	2204	100 43 43	2202	102 32 7	2201	104 20 33	2200
	Spica	W.	45 22 35	2268	47 9 21	2263	48 56 15	2259	50 43 15	2255
	MARS	W.	38 53 48	2415	40 37 1	2410	42 20 21	2405	44 3 48	2402
	α Aquilæ	E.	55 56 22	3142	54 29 3	3184	53 2 35	3232	51 37 4	3285
	Fomalhaut	E.	86 54 46	2426	85 11 49	2426	83 28 52	2427	81 45 56	2429
20	Spica	W.	59 39 12	2248	61 26 28	2249	63 13 43	2249	65 0 57	2251
	MARS	W.	52 41 59	2394	54 25 42	2395	56 9 24	2396	57 53 4	2398
	JUPITER	W.	25 18 44	2252	27 5 54	2248	28 53 10	2245	30 40 30	2245
	Fomalhaut	E.	73 12 17	2451	71 29 55	2458	69 47 43	2466	68 5 42	2475
	α Pegasi	E.	89 6 2	2578	87 26 37	2581	85 47 16	2585	84 8 1	2591
21	Spica	W.	73 56 12	2268	75 42 59	2272	77 29 39	2278	79 16 11	2285
	MARS	W.	66 30 28	2417	68 13 39	2422	69 56 43	2426	71 39 40	2433
	JUPITER	W.	39 37 4	2253	41 24 13	2257	43 11 16	2262	44 58 12	2266
	Antares	W.	28 41 20	2445	30 23 50	2430	32 6 42	2417	33 49 52	2408
	Fomalhaut	E.	59 39 35	2543	57 59 22	2561	56 19 34	2581	54 40 13	2603
	α Pegasi	E.	75 54 10	2636	74 16 4	2649	72 38 15	2663	71 0 45	2678
22	Spica	W.	88 6 20	2322	89 51 48	2331	91 37 2	2341	93 22 2	2350
	MARS	W.	80 11 54	2472	81 53 46	2482	83 35 25	2492	85 16 50	2502
	JUPITER	W.	53 50 41	2302	55 36 38	2310	57 22 23	2319	59 7 55	2328

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13	JUPITER	E.	67° 11′ 44″	2460	65° 29′ 34″	2452	63° 47′ 13″	2445	62° 4′ 42″	2437
	Antares	E.	79 8 57	2509	77 27 56	2502	75 46 45	2495	74 5 25	2488
14	SUN	W.	70 22 39	2704	71 59 13	2697	73 35 57	2689	75 12 52	2681
	Regulus	W.	35 7 23	2403	36 50 54	2394	38 34 37	2387	40 18 31	2379
	MARS	E.	23 59 15	2717	22 22 58	2736	20 47 6	2762	19 11 48	2798
	JUPITER	E.	53 29 35	2403	51 46 5	2396	50 2 25	2390	48 18 36	2384
	Antares	E.	65 36 24	2457	63 54 10	2451	62 11 48	2446	60 29 19	2441
15	SUN	W.	83 20 7	2642	84 58 5	2635	86 36 13	2626	88 14 32	2620
	Regulus	W.	49 0 46	2342	50 45 45	2334	52 30 55	2327	54 16 15	2320
	JUPITER	E.	39 37 22	2356	37 52 44	2351	36 7 59	2347	34 23 8	2343
	Antares	E.	51 55 14	2421	50 12 9	2418	48 29 0	2417	46 45 49	2415
16	SUN	W.	96 28 29	2585	98 7 45	2578	99 47 10	2572	101 26 44	2566
	Regulus	W.	63 5 26	2287	64 51 45	2281	66 38 13	2274	68 24 50	2269
	JUPITER	E.	25 37 51	2337	23 52 45	2340	22 7 43	2345	20 22 49	2355
	Antares	E.	38 9 51	2424	36 26 51	2431	34 44 0	2438	33 1 20	2449
17	SUN	W.	109 46 37	2537	111 26 59	2532	113 7 28	2527	114 48 3	2523
	Regulus	W.	77 19 59	2242	79 7 24	2237	80 54 57	2233	82 42 36	2229
	α Aquilæ	E.	74 5 52	2889	72 33 19	2897	71 0 56	2907	69 28 46	2919
18	SUN	W.	123 12 25	2504	124 53 32	2502	126 34 43	2499	128 15 58	2497
	Regulus	W.	91 42 17	2211	93 30 28	2208	95 18 43	2206	97 7 1	2205
	Spica	W.	38 17 12	2298	40 3 15	2289	41 49 31	2281	43 35 58	2274
	MARS	W.	32 2 44	2448	33 45 10	2438	35 27 51	2429	37 10 44	2422
	α Aquilæ	E.	61 52 36	3013	60 22 39	3039	58 53 15	3069	57 24 28	3103
	Fomalhaut	E.	93 46 13	2434	92 3 27	2431	90 20 36	2429	88 37 42	2427
19	Regulus	W.	106 9 0	2200	107 57 27	2201	109 45 53	2202	111 34 17	2204
	Spica	W.	52 30 21	2253	54 17 30	2251	56 4 42	2249	57 51 56	2248
	MARS	W.	45 47 20	2399	47 30 56	2397	49 14 35	2396	50 58 16	2394
	α Aquilæ	E.	50 12 35	3345	48 49 15	3410	47 27 10	3484	46 6 28	3568
	Fomalhaut	E.	80 3 2	2431	78 20 12	2435	76 37 27	2439	74 54 48	2445
20	Spica	W.	66 48 8	2253	68 35 16	2256	70 22 20	2260	72 9 19	2264
	MARS	W.	59 36 41	2401	61 20 15	2403	63 3 45	2407	64 47 10	2412
	JUPITER	W.	32 27 51	2245	34 15 12	2245	36 2 32	2247	37 49 50	2249
	Fomalhaut	E.	66 23 54	2487	64 42 22	2499	63 1 7	2512	61 20 11	2527
	α Pegasi	E.	82 28 54	2598	80 49 56	2605	79 11 8	2614	77 32 32	2624
21	Spica	W.	81 2 33	2291	82 48 46	2298	84 34 49	2306	86 20 40	2313
	MARS	W.	73 22 28	2440	75 5 6	2448	76 47 33	2455	78 29 49	2463
	JUPITER	W.	46 45 1	2272	48 31 41	2279	50 18 12	2286	52 4 32	2294
	Antares	W.	35 33 15	2402	37 16 47	2397	39 0 26	2395	40 44 8	2395
	Fomalhaut	E.	53 1 22	2627	51 23 4	2653	49 45 21	2682	48 8 17	2714
	α Pegasi	E.	69 23 35	2695	67 46 48	2714	66 10 27	2735	64 34 33	2756
22	Spica	W.	95 6 48	2361	96 51 19	2372	98 35 34	2383	100 19 33	2395
	MARS	W.	86 58 0	2513	88 38 55	2524	90 19 35	2535	91 59 59	2547
	JUPITER	W.	60 53 13	2338	62 38 17	2348	64 23 6	2359	66 7 39	2371

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			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
22	Antares	W.	42 27 50	2396	44 11 30	2398	45 55 7	2401	47 38 40	2405
	Fomalhaut	E.	46 31 56	2749	44 56 21	2788	43 21 37	2831	41 47 49	2878
	α Pegasi	E.	62 59 8	2781	61 24 15	2806	59 49 55	2835	58 16 12	2865
23	Spica	W.	102 3 15	2408	103 46 39	2420	105 29 45	2433	107 12 33	2446
	Mars	W.	93 40 7	2560	95 19 57	2573	96 59 29	2586	98 38 43	2600
	Jupiter	W.	67 51 55	2382	69 35 55	2394	71 19 38	2406	73 3 4	2419
	Antares	W.	56 14 19	2442	57 56 54	2452	59 39 15	2462	61 21 22	2472
	α Pegasi	E.	50 38 26	3059	49 9 26	3109	47 41 27	3163	46 14 33	3221
	α Arietis	E.	91 46 43	2525	90 6 5	2538	88 25 44	2550	86 45 40	2564
24	Jupiter	W.	81 35 36	2486	83 17 9	2500	84 58 22	2515	86 39 14	2530
	Antares	W.	69 48 3	2532	71 28 32	2545	73 8 43	2558	74 48 36	2572
	α Arietis	E.	78 30 10	2638	76 52 6	2654	75 14 24	2671	73 37 5	2688
	Aldebaran	E.	109 53 24	2476	108 11 37	2490	106 30 10	2504	104 49 3	2519
25	Jupiter	W.	94 58 26	2605	96 37 14	2621	98 15 41	2635	99 53 48	2651
	Antares	W.	83 3 11	2643	84 41 7	2658	86 18 43	2673	87 55 59	2689
	α Aquilæ	W.	43 49 34	4031	45 0 43	3964	46 12 58	3906	47 26 12	3854
	α Arietis	E.	65 36 33	2783	64 1 43	2804	62 27 20	2825	60 53 24	2847
	Aldebaran	E.	96 28 35	2593	94 49 31	2609	93 10 48	2624	91 32 25	2639
26	Antares	W.	95 57 13	2765	97 32 27	2780	99 7 21	2795	100 41 55	2810
	α Aquilæ	W.	53 43 35	3679	55 0 44	3657	56 18 17	3637	57 36 11	3622
	α Arietis	E.	53 11 3	2965	51 40 7	2992	50 9 44	3019	48 39 55	3048
	Aldebaran	E.	83 25 40	2715	81 49 20	2729	80 13 19	2744	78 37 37	2759
	Sun	E.	139 13 42	3047	137 44 28	3064	136 15 34	3079	134 46 59	3095
27	α Aquilæ	W.	64 9 18	3571	65 28 24	3565	66 47 36	3563	68 6 51	3560
	α Arie is	E.	41 20 9	3213	39 54 15	3253	38 29 8	3295	37 4 51	3341
	Aldebaran	E.	70 43 55	2830	69 10 6	2843	67 36 34	2855	66 3 18	2868
	Sun	E.	127 28 50	3172	126 2 7	3186	124 35 41	3200	123 9 32	3214
28	α Aquilæ	W.	74 43 27	3562	76 2 43	3564	77 21 57	3567	78 41 7	3571
	Fomalhaut	W.	39 38 14	3509	40 58 28	3485	42 19 9	3464	43 40 13	3446
	α Pegasi	W.	29 55 15	5039	30 51 40	4863	31 50 25	4710	32 51 16	4578
	Aldebaran	E.	58 21 0	2928	56 49 17	2939	55 17 48	2950	53 46 33	2961
	Sun	E.	116 2 47	3279	114 38 11	3291	113 13 49	3302	111 49 40	3313
29	Fomalhaut	W.	50 29 46	3386	51 52 18	3379	53 14 58	3372	54 37 46	3366
	α Pegasi	W.	38 20 11	4125	39 29 49	4062	40 40 28	4007	41 52 1	3956
	Aldebaran	E.	46 13 20	3005	44 43 14	3014	43 13 18	3021	41 43 31	3028
	Sun	E.	104 51 58	3362	103 28 58	3371	102 6 8	3379	100 43 27	3386
30	Fomalhaut	W.	61 33 19	3344	62 56 40	3340	64 20 5	3336	65 43 35	3332
	α Pegasi	W.	48 0 44	3772	49 16 15	3745	50 32 15	3720	51 48 41	3696
	Aldebaran	E.	34 16 34	3056	32 47 31	3060	31 18 33	3064	29 49 39	3067
	Sun	E.	93 51 56	3415	92 29 56	3420	91 8 2	3423	89 46 12	3427
31	Fomalhaut	W.	72 42 2	3316	74 5 55	3313	75 29 52	3309	76 53 53	3305
	α Pegasi	W.	58 16 34	3600	59 35 8	3586	60 53 58	3570	62 13 5	3555
	Sun	E.	82 57 45	3435	81 36 8	3435	80 14 31	3436	78 52 55	3435

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22	Antares	W.	49 22 7	2412	51 5 25	2418	52 48 34	2426	54 31 32	2434
	Fomalhaut	E.	40 15 2	2931	38 43 22	2989	37 12 56	3056	35 43 52	3129
	α Pegasi	E.	56 43 8	2898	55 10 46	2934	53 39 10	2972	52 8 22	3014
23	Spica	W.	108 55 2	2460	110 37 12	2474	112 19 2	2489	114 0 31	2504
	Mars	W.	100 17 38	2614	101 56 14	2628	103 34 31	2643	105 12 28	2658
	Jupiter	W.	74 46 12	2432	76 29 1	2445	78 11 31	2458	79 53 43	2472
	Antares	W.	63 3 14	2483	64 44 51	2494	66 26 12	2507	68 7 16	2519
	α Pegasi	E.	44 48 49	3285	43 24 20	3355	42 1 12	3431	40 39 31	3517
	α Arietis	E.	85 5 55	2577	83 26 29	2591	81 47 22	2606	80 8 35	2622
24	Jupiter	W.	88 19 45	2545	89 59 56	2559	91 39 47	2574	93 19 17	2590
	Antares	W.	76 28 10	2585	78 7 25	2600	79 46 20	2615	81 24 55	2629
	α Arietis	E.	72 0 9	2706	70 23 37	2725	68 47 30	2744	67 11 49	2763
	Aldebaran	E.	103 8 16	2534	101 27 50	2548	99 47 44	2564	98 7 59	2579
25	Jupiter	W.	101 31 31	2666	103 8 59	2682	104 46 3	2698	106 22 46	2713
	Antares	W.	89 32 54	2704	91 9 29	2719	92 45 44	2734	94 21 39	2750
	α Aquilæ	W.	48 40 19	3809	49 55 12	3770	51 10 45	3736	52 26 54	3706
	α Arietis	E.	59 19 57	2869	57 46 59	2892	56 14 30	2916	54 42 31	2940
	Aldebaran	E.	89 54 23	2655	88 16 42	2669	86 39 21	2684	85 2 20	2700
26	Antares	W.	102 16 10	2825	103 50 5	2841	105 23 40	2855	106 56 56	2869
	α Aquilæ	W.	58 54 22	3607	60 12 49	3595	61 31 29	3586	62 50 19	3577
	α Arietis	E.	47 10 42	3078	45 42 5	3109	44 14 6	3142	42 46 47	3176
	Aldebaran	E.	77 2 15	2773	75 27 12	2788	73 52 28	2801	72 18 2	2816
	Sun	E.	133 18 43	3111	131 50 47	3127	130 23 10	3142	128 55 51	3157
27	α Aquilæ	W.	69 26 9	3558	70 45 29	3558	72 4 49	3558	73 24 9	3560
	α Arietis	E.	35 41 27	3391	34 19 0	3445	32 57 34	3504	31 37 14	3570
	Aldebaran	E.	64 30 18	2881	62 57 35	2894	61 25 8	2906	59 52 57	2917
	Sun	E.	121 43 39	3228	120 18 3	3242	118 52 43	3254	117 27 38	3266
28	α Aquilæ	W.	80 0 13	3575	81 19 15	3579	82 38 12	3585	83 57 3	3590
	Fomalhaut	W.	45 1 37	3431	46 23 18	3418	47 45 14	3406	49 7 24	3395
	α Pegasi	W.	33 54 0	4463	34 58 25	4362	36 4 21	4273	37 11 39	4194
	Aldebaran	E.	52 15 31	2970	50 44 41	2980	49 14 3	2989	47 43 36	2997
	Sun	E.	110 25 44	3325	109 2 1	3334	107 38 29	3344	106 15 8	3353
29	Fomalhaut	W.	56 0 41	3360	57 23 43	3356	58 46 50	3351	60 10 2	3347
	α Pegasi	W.	43 4 24	3913	44 17 31	3872	45 31 19	3836	46 45 44	3802
	Aldebaran	E.	40 13 53	3034	38 44 23	3040	37 15 0	3046	35 45 44	3051
	Sun	E.	99 20 54	3393	97 58 29	3400	96 36 12	3405	95 14 1	3410
30	Fomalhaut	W.	67 7 9	3329	68 30 47	3326	69 54 28	3323	71 18 13	3319
	α Pegasi	W.	53 5 32	3675	54 22 46	3654	55 40 22	3635	56 58 18	3617
	Aldebaran	E.	28 20 49	3070	26 52 3	3073	25 23 20	3075	23 54 40	3077
	Sun	E.	88 24 26	3430	87 2 43	3431	85 41 2	3433	84 19 23	3434
31	Fomalhaut	W.	78 17 59	3301	79 42 9	3297	81 6 24	3293	82 30 44	3289
	α Pegasi	W.	63 32 28	3542	64 52 6	3528	66 11 59	3516	67 32 5	3504
	Sun	E.	77 31 18	3433	76 9 39	3431	74 47 57	3428	73 26 12	3425

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.	Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Added to / Subtracted from Apparent Time.	Diff. for 1 Hour.
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Wed.	1	8 48 8.71	9.695	N. 17 51 33.5	−38.26	15 48.08	66.59	6 2.06	0.161
Thur.	2	8 52 1.06	9.670	17 36 6.5	38.98	15 48.21	66.50	5 57.87	0.186
Frid.	3	8 55 52.83	9.646	17 20 22.3	39.69	15 48.34	66.41	5 53.10	0.210
Sat.	4	8 59 44.01	9.621	17 4 21.1	−40.39	15 48.47	66.32	5 47.74	0.235
SUN.	5	9 3 34.60	9.597	16 48 3.3	41.08	15 48.61	66.23	5 41.79	0.259
Mon.	6	9 7 24.60	9.572	16 31 29.2	41.75	15 48.76	66.15	5 35.25	0.284
Tues.	7	9 11 14.01	9.547	16 14 39.0	−42.42	15 48.91	66.06	5 28.12	0.308
Wed.	8	9 15 2.84	9.522	15 57 33.1	43.07	15 49.06	65.98	5 20.41	0.333
Thur.	9	9 18 51.08	9.498	15 40 11.9	43.71	15 49.22	65.89	5 12.12	0.357
Frid.	10	9 22 38.74	9.474	15 22 35.6	−44.33	15 49.39	65.81	5 3.25	0.381
Sat.	11	9 26 25.82	9.450	15 4 44.5	44.94	15 49.56	65.73	4 53.80	0.405
SUN.	12	9 30 12.32	9.426	14 46 38.9	45.53	15 49.73	65.65	4 43.78	0.429
Mon.	13	9 33 58.25	9.402	14 28 19.3	−46.11	15 49.91	65.57	4 33.19	0.453
Tues.	14	9 37 43.62	9.379	14 9 45.9	46.68	15 50.09	65.49	4 22.04	0.476
Wed.	15	9 41 28.44	9.356	13 50 59.0	47.23	15 50.27	65.41	4 10.33	0.499
Thur.	16	9 45 12.72	9.334	13 31 59.0	−47.77	15 50.46	65.34	3 58.08	0.521
Frid.	17	9 48 56.47	9.312	13 12 46.2	48.29	15 50.65	65.27	3 45.30	0.543
Sat.	18	9 52 39.69	9.291	12 53 20.9	48.80	15 50.85	65.20	3 32.01	0.564
SUN.	19	9 56 22.41	9.270	12 33 43.3	−49.31	15 51.05	65.13	3 18.22	0.585
Mon.	20	10 0 4.64	9.250	12 13 53.9	49.80	15 51.25	65.06	3 3.94	0.605
Tues.	21	10 3 46.40	9.231	11 53 52.9	50.28	15 51.45	64.99	2 49.19	0.624
Wed.	22	10 7 27.70	9.212	11 33 40.6	−50.74	15 51.65	64.93	2 33.97	0.643
Thur.	23	10 11 8.56	9.193	11 13 17.3	51.19	15 51.85	64.86	2 18.32	0.661
Frid.	24	10 14 49.01	9.176	10 52 43.4	51.63	15 52.06	64.80	2 2.26	0.678
Sat.	25	10 18 29.06	9.160	10 31 59.1	−52.06	15 52.27	64.74	1 45.79	0.694
SUN.	26	10 22 8.71	9.144	10 11 4.7	52.47	15 52.48	64.68	1 28.93	0.710
Mon.	27	10 25 48.00	9.129	9 50 0.6	52.87	15 52.69	64.62	1 11.71	0.725
Tues.	28	10 29 26.94	9.115	9 28 47.0	−53.26	15 52.91	64.57	0 54.15	0.739
Wed.	29	10 33 5.55	9.102	9 7 24.2	53.63	15 53.13	64.52	0 36.26	0.752
Thur.	30	10 36 43.83	9.089	8 45 52.7	53.99	15 53.35	64.47	0 18.04	0.765
Frid.	31	10 40 21.82	9.077	8 24 12.7	54.34	15 53.57	64.42	0 0.48	0.777
Sat.	32	10 43 59.52	9.065	N. 8 2 24.4	−54.68	15 53.80	64.38	0 19.28	0.789

NOTE.—The mean time of semidiameter passing may be found by subtracting 0s.18 from the sidereal time.
The sign − prefixed to the hourly change of declination indicates that north declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	Diff. for 1 Hour.	THE SUN'S Apparent Declination.	Diff. for 1 Hour.	Equation of Time, to be Subtracted from / Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	s	m s	s	h m s
Wed.	1	8 48 7.73	9.695	N. 17 51 37.4	−38.26	6 2.07	0.161	8 42 5.66
Thur.	2	8 52 0.10	9.670	17 36 10.4	38.98	5 57.88	0.186	8 46 2.22
Frid.	3	8 55 51.88	9.646	17 20 26.2	39.69	5 53.11	0.210	8 49 58.77
Sat.	4	8 59 43.08	9.621	17 4 25.0	−40.39	5 47.75	0.235	8 53 55.33
SUN.	5	9 3 33.69	9.597	16 48 7.2	41.08	5 41.81	0.259	8 57 51.88
Mon.	6	9 7 23.71	9.572	16 31 33.1	41.75	5 35.27	0.284	9 1 48.44
Tues.	7	9 11 13.14	9.548	16 14 42.9	−42.42	5 28.15	0.308	9 5 44.99
Wed.	8	9 15 1.99	9.523	15 57 37.0	43.07	5 20.44	0.333	9 9 41.55
Thur.	9	9 18 50.26	9.499	15 40 15.7	43.71	5 12.15	0.357	9 13 38.10
Frid.	10	9 22 37.94	9.475	15 22 39.3	−44.33	5 3.28	0.381	9 17 34.66
Sat.	11	9 26 25.05	9.451	15 4 48.1	44.94	4 53.83	0.405	9 21 31.21
SUN.	12	9 30 11.58	9.427	14 46 42.5	45.53	4 43.81	0.429	9 25 27.77
Mon.	13	9 33 57.54	9.403	14 28 22.8	−46.11	4 33.22	0.453	9 29 24.32
Tues.	14	9 37 42.94	9.380	14 9 49.3	46.68	4 22.07	0.476	9 33 20.88
Wed.	15	9 41 27.79	9.357	13 51 2.3	47.23	4 10.36	0.499	9 37 17.43
Thur.	16	9 45 12.10	9.335	13 32 2.2	−47.77	3 58.11	0.521	9 41 13.99
Frid.	17	9 48 55.88	9.313	13 12 49.3	48.30	3 45.33	0.543	9 45 10.54
Sat.	18	9 52 39.14	9.292	12 53 23.8	48.81	3 32.04	0.564	9 49 7.10
SUN.	19	9 56 21.90	9.271	12 33 46.1	−49.32	3 18.25	0.585	9 53 3.65
Mon.	20	10 0 4.17	9.251	12 13 56.5	49.81	3 3.97	0.605	9 57 0.20
Tues.	21	10 3 45.97	9.232	11 53 55.3	50.29	2 49.22	0.624	10 0 56.75
Wed.	22	10 7 27.31	9.213	11 33 42.8	−50.75	2 34.00	0.643	10 4 53.31
Thur.	23	10 11 8.21	9.195	11 13 19.3	51.20	2 18.35	0.661	10 8 49.86
Frid.	24	10 14 48.70	9.178	10 52 45.2	51.64	2 2.28	0.678	10 12 46.42
Sat.	25	10 18 28.79	9.162	10 32 0.7	−52.07	1 45.81	0.694	10 16 42.97
SUN.	26	10 22 8.48	9.146	10 11 6.1	52.48	1 28.95	0.710	10 20 39.53
Mon.	27	10 25 47.81	9.131	9 50 1.7	52.88	1 11.73	0.725	10 24 36.08
Tues.	28	10 29 26.80	9.117	9 28 47.8	−53.27	0 54.17	0.739	10 28 32.63
Wed.	29	10 33 5.45	9.104	9 7 24.8	53.64	0 36.27	0.752	10 32 29.18
Thur.	30	10 36 43.78	9.091	8 45 53.0	54.00	0 18.04	0.765	10 36 25.74
Frid.	31	10 40 21.81	9.079	8 24 12.7	54.35	0 0.48	0.777	10 40 22.29
Sat.	32	10 43 59.56	9.067	N. 8 2 24.1	−54.69	0 19.28	0.789	10 44 18.84

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign − prefixed to the hourly change of declination indicates that north declinations are decreasing.

Diff. for 1 Hour, +9s.8565. (Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S TRUE LONGITUDE. λ	THE SUN'S TRUE LONGITUDE. λ'	Diff. for 1 Hour.	THE SUN'S LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
								h m s
1	214	129° 35′ 41″.8	35′ 26″.4	143″.60	− 0″.71	0.0063313	−23.5	15 15 23.96
2	215	130 33 8.8	32 53.3	143.65	0.63	0.0062738	24.4	15 11 28.05
3	216	131 30 36.9	30 21.3	143.70	0.52	0.0062142	25.3	15 7 32.14
4	217	132 28 6.2	27 50.4	143.75	− 0.39	0.0061525	−26.2	15 3 36.23
5	218	133 25 36.7	25 20.7	143.80	0.26	0.0060885	27.2	14 59 40.32
6	219	134 23 8 4	22 52.3	143.85	− 0.12	0.0060221	28.2	14 55 44.41
7	220	135 20 41.2	20 25.0	143.90	+ 0.01	0.0059533	−29.2	14 51 48.50
8	221	136 18 15.2	17 58.9	143.94	0.14	0.0058822	30.1	14 47 52.59
9	222	137 15 50.2	15 33.7	143.98	0.25	0.0058090	31.0	14 43 56.68
10	223	138 13 26.2	13 9.6	144.02	+ 0.34	0.0057335	−31.9	14 40. 0.77
11	224	139 11 3.3	10 46.6	144.07	0.40	0.0056558	32.8	14 36 4 87
12	225	140 8 41.4	8 24.6	144.11	0.44	0.0055761	33.6	14 32 8.96
13	226	141 6 20.4	6 3.5	144.15	+ 0.44	0.0054944	−34.4	14 28 13.05
14	227	142 4 0.4	3 43.4	144.19	0.40	0.0054110	35.1	14 24 17.14
15	228	143 1 41.5	1 24.3	144.24	0.34	0.0053259	35.7	14 20 21.23
16	229	143 59 23.7	59 6.4	144.28	+ 0.27	0.0052391	−36.3	14 16 25.32
17	230	144 57 6.9	56 49.5	144.33	0.16	0.0051515	36.8	14 12 29.41
18	231	145 54 51.2	54 33.7	144.38	+ 0.03	0.0050625	37.3	14 8 33.50
19	232	146 52 36.7	52 19.0	144.43	− 0.10	0.0049724	−37.7	14 4 37.60
20	233	147 50 23 5	50 5.7	144.48	0.22	0.0048813	38.1	14 0 41.69
21	234	148 48 11.6	47 53.7	144.54	0.35	0.0047894	38.4	13 56 45.78
22	235	149 46 1.2	45 43.2	144.60	− 0.46	0.0046967	−38.8	13 52 49.87
23	236	150 43 52.3	43 34.2	144.66	0.56	0.0046032	39.1	13 48 53.97
24	237	151 41 45.0	41 26.8	144.73	0.63	0.0045089	39.5	13 44 58.06
25	238	152 39 39.3	39 21.0	144.80	− 0.67	0.0044138	−39.8	13 41 2.15
26	239	153 37 35.3	37 16.9	144.87	0.68	0.0043179	40.2	13 37 6.24
27	240	154 35 33.1	35 14.6	144.95	0.67	0.0042210	40.6	13 33 10.34
28	241	155 33 32.9	33 14.3	145.03	− 0.61	0.0041231	−41.1	13 29 14.43
29	242	156 31 34.6	31 15.9	145.11	0.54	0.0040240	41.6	13 25 18.52
30	243	157 29 38.2	29 19.4	145.19	0.43	0.0039237	42.1	13 21 22.61
31	244	158 27 43.7	27 24.8	145.27	0.32	0.0038221	42.6	13 17 26.71
32	245	159 25 51.2	25 32.2	145.35	− 0.18	0.0037192	−43.2	13 13 30.80

NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ', to the mean equinox of January $0^d.0$.

Diff. for 1 Hour, $-9^s.8296$. (Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER. Noon.	SEMIDIAMETER. Midnight.	HORIZONTAL PARALLAX. Noon.	Diff. for 1 Hour.	HORIZONTAL PARALLAX. Midnight.	Diff. for 1 Hour.	UPPER TRANSIT. Meridian of Greenwich.	Diff. for 1 Hour.	AGE. Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	14 49.2	14 50.6	54 16.6	+0.32	54 21.6	+0.52	19 39.7	1.94	23.2
2	14 52.6	14 55.2	54 29.0	0.71	54 38.6	0.88	20 27.2	2.03	24.2
3	14 58.4	15 2.0	54 50.2	1.04	55 3.6	1.18	21 16.9	2.11	25.2
4	15 6.1	15 10.5	55 18.5	+1.30	55 34.7	+1.39	22 8.3	2.17	26.2
5	15 15.2	15 20.1	55 51.9	1.47	56 9.9	1.52	23 0.8	2.20	27.2
6	15 25.1	15 30.1	56 28.3	1.53	56 46.7	1.52	23 53.5	2.19	28.2
7	15 35.1	15 39.9	57 4.9	+1.49	57 22.5	+1.44			29.2
8	15 44.5	15 48.8	57 39.4	1.37	57 55.3	1.28	0 45.8	2.16	0.7
9	15 52.8	15 56.4	58 10.0	1.17	58 23.4	1.06	1 37.2	2.12	1.7
10	15 59.7	16 2.5	58 35.3	+0.93	58 45.7	+0.80	2 27.8	2.09	2.7
11	16 4.9	16 6.9	58 54.6	0.68	59 2.0	0.56	3 18.0	2.09	3.7
12	16 8.6	16 9.8	59 7.9	0.44	59 12.5	0.32	4 8.4	2.12	4.7
13	16 10.6	16 11.2	59 15.6	+0.21	59 17.5	+0.10	4 59.8	2.17	5.7
14	16 11.3	16 11.2	59 18.1	0.00	59 17.5	−0.10	5 52.8	2.26	6.7
15	16 10.6	16 9.8	59 15.6	−0.21	59 12.5	0.31	6 48.0	2.34	7.7
16	16 8.6	16 7.1	59 8.1	−0.42	59 2.4	−0.53	7 45.0	2.41	8.7
17	16 5.1	16 2.9	58 55.4	0.64	58 47.0	0.76	8 43.3	2.43	9.7
18	16 0.2	15 57.1	58 37.2	0.88	58 26.0	0.99	9 41.3	2.39	10.7
19	15 53.7	15 49.9	58 13.4	−1.11	57 59.5	−1.21	10 37.8	2.30	11.7
20	15 45.8	15 41.4	57 44.4	1.30	57 28.3	1.38	11 31.7	2.18	12.7
21	15 36.8	15 32.0	57 11.3	1.44	56 53.8	1.48	12 22.5	2.05	13.7
22	15 27.1	15 22.2	56 35.8	−1.50	56 17.7	−1.50	13 10.4	1.94	14.7
23	15 17.4	15 12.6	55 59.9	1.47	55 42.5	1.41	13 55.8	1.85	15.7
24	15 8.1	15 3.9	55 26.0	1.33	55 10.5	1.23	14 39.6	1.80	16.7
25	15 0.1	14 56.7	54 56.4	−1.11	54 44.0	−0.96	15 22.4	1.77	17.7
26	14 53.8	14 51.5	54 33.4	0.80	54 24.9	0.62	16 5.1	1.79	18.7
27	14 49.8	14 48.7	54 18.6	0.43	54 14.7	−0.22	16 48.4	1.83	19.7
28	14 48.3	14 48.6	54 13.3	−0.01	54 14.4	+0.20	17 33.0	1.89	20.7
29	14 49.6	14 51.4	54 18.1	+0.42	54 24.4	0.63	18 19.3	1.97	21.7
30	14 53.8	14 56.9	54 33.3	0.84	54 44.7	1.05	19 7.6	2.06	22.7
31	15 0.6	15 5.0	54 58.5	1.24	55 14.4	1.41	19 57.8	2.13	23.7
32	15 9.8	15 15.2	55 32.3	+1.56	55 51.9	+1.70	20 49.5	2.18	24.7

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	3 45 37.27	1.9764	N.15 2 55.6	7.762
1	3 47 35.94	1.9793	15 10 39.5	7.700
2	3 49 34.79	1.9822	15 18 19.6	7.637
3	3 51 33.81	1.9852	15 25 55.9	7.573
4	3 53 33.01	1.9882	15 33 28.4	7.509
5	3 55 32.39	1.9912	15 40 57.0	7.444
6	3 57 31.96	1.9943	15 48 21.7	7.379
7	3 59 31.71	1.9973	15 55 42.5	7.312
8	4 1 31.64	2.0004	16 2 59.2	7.245
9	4 3 31.76	2.0036	16 10 11.9	7.177
10	4 5 32.07	2.0067	16 17 20.5	7.109
11	4 7 32.56	2.0098	16 24 25.0	7.041
12	4 9 33.24	2.0129	16 31 25.4	6.972
13	4 11 34.11	2.0161	16 38 21.6	6.902
14	4 13 35.18	2.0194	16 45 13.6	6.831
15	4 15 36.44	2.0226	16 52 1.3	6.759
16	4 17 37.89	2.0259	16 58 44.7	6.688
17	4 19 39.54	2.0292	17 5 23.8	6.616
18	4 21 41.39	2.0325	17 11 58.6	6.542
19	4 23 43.44	2.0357	17 18 28.9	6.468
20	4 25 45.68	2.0390	17 24 54.8	6.394
21	4 27 48.12	2.0423	17 31 16.2	6.318
22	4 29 50.76	2.0457	17 37 33.0	6.242
23	4 31 53.61	2.0491	N.17 43 45.3	6.166

THURSDAY 2.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	4 33 56.66	2.0525	N.17 49 53.0	6.089
1	4 35 59.91	2.0558	17 55 56.0	6.012
2	4 38 3.36	2.0592	18 1 54.4	5.934
3	4 40 7.02	2.0627	18 7 48.1	5.855
4	4 42 10.88	2.0661	18 13 37.0	5.775
5	4 44 14.95	2.0695	18 19 21.1	5.694
6	4 46 19.22	2.0728	18 25 0.3	5.613
7	4 48 23.69	2.0762	18 30 34.7	5.532
8	4 50 28.37	2.0797	18 36 4.2	5.450
9	4 52 33.26	2.0832	18 41 28.7	5.367
10	4 54 38.35	2.0866	18 46 48.3	5.284
11	4 56 43.65	2.0901	18 52 2.8	5.200
12	4 58 49.16	2.0935	18 57 12.3	5.116
13	5 0 54.87	2.0969	19 2 16.7	5.030
14	5 3 0.79	2.1004	19 7 15.9	4.944
15	5 5 6.92	2.1038	19 12 10.0	4.857
16	5 7 13.25	2.1072	19 16 58.8	4.770
17	5 9 19.78	2.1106	19 21 42.4	4.682
18	5 11 26.52	2.1141	19 26 20.7	4.594
19	5 13 33.47	2.1175	19 30 53.7	4.505
20	5 15 40.62	2.1208	19 35 21.3	4.415
21	5 17 47.97	2.1242	19 39 43.5	4.324
22	5 19 55.52	2.1276	19 44 0.2	4.233
23	5 22 3.28	2.1310	19 48 11.5	4.142
24	5 24 11.24	2.1343	N.19 52 17.3	4.050

FRIDAY 3.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	5 24 11.24	2.1343	N.19 52 17.3	4.050
1	5 26 19.40	2.1377	19 56 17.6	3.957
2	5 28 27.76	2.1410	20 0 12.2	3.864
3	5 30 36.32	2.1443	20 4 1.2	3.770
4	5 32 45.08	2.1476	20 7 44.6	3.676
5	5 34 54.03	2.1509	20 11 22.3	3.580
6	5 37 3.18	2.1542	20 14 54.2	3.484
7	5 39 12.53	2.1574	20 18 20.4	3.388
8	5 41 22.07	2.1606	20 21 40.8	3.292
9	5 43 31.80	2.1638	20 24 55.4	3.194
10	5 45 41.73	2.1670	20 28 4.1	3.096
11	5 47 51.84	2.1701	20 31 6.9	2.997
12	5 50 2.14	2.1732	20 34 3.8	2.898
13	5 52 12.63	2.1763	20 36 54.7	2.798
14	5 54 23.30	2.1794	20 39 39.6	2.698
15	5 56 34.16	2.1825	20 42 18.5	2.597
16	5 58 45.20	2.1855	20 44 51.3	2.496
17	6 0 56.42	2.1885	20 47 18.0	2.395
18	6 3 7.82	2.1914	20 49 38.7	2.293
19	6 5 19.39	2.1943	20 51 53.2	2.190
20	6 7 31.14	2.1972	20 54 1.5	2.087
21	6 9 43.06	2.2001	20 56 3.6	1.982
22	6 11 55.15	2.2029	20 57 59.4	1.877
23	6 14 7.41	2.2057	N.20 59 48.9	1.772

SATURDAY 4.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	6 16 19.84	2.2085	N.21 1 32.1	1.667
1	6 18 32.43	2.2112	21 3 9.0	1.562
2	6 20 45.18	2.2138	21 4 39.5	1.456
3	6 22 58.09	2.2165	21 6 3.7	1.349
4	6 25 11.16	2.2192	21 7 21.4	1.242
5	6 27 24.39	2.2217	21 8 32.7	1.135
6	6 29 37.77	2.2242	21 9 37.6	1.027
7	6 31 51.30	2.2267	21 10 36.0	0.918
8	6 34 4.98	2.2292	21 11 27.8	0.809
9	6 36 18.80	2.2315	21 12 13.1	0.700
10	6 38 32.76	2.2338	21 12 51.8	0.590
11	6 40 46.86	2.2361	21 13 23.9	0.481
12	6 43 1.10	2.2384	21 13 49.5	0.371
13	6 45 15.47	2.2406	21 14 8.4	0.260
14	6 47 29.97	2.2427	21 14 20.7	0.149
15	6 49 44.60	2.2449	21 14 26.3	+ 0.038
16	6 51 59.36	2.2470	21 14 25.2	− 0.074
17	6 54 14.24	2.2490	21 14 17.4	0.187
18	6 56 29.24	2.2510	21 14 2.8	0.299
19	6 58 44.36	2.2529	21 13 41.5	0.411
20	7 0 59.59	2.2547	21 13 13.5	0.524
21	7 3 14.93	2.2566	21 12 38.7	0.637
22	7 5 30.38	2.2583	21 11 57.1	0.750
23	7 7 45.93	2.2600	21 11 8.7	0.863
24	7 10 1.58	2.2617	N.21 10 13.5	0.977

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SUNDAY 5.			
	h m s	s	° ′ ″	″
0	7 10 1.58	2.2617	N.21 10 13.5	0.977
1	7 12 17.33	2.2633	21 9 11.5	1.091
2	7 14 33.17	2.2649	21 8 2.6	1.205
3	7 16 49.11	2.2664	21 6 46.9	1.319
4	7 19 5.14	2.2678	21 5 24.3	1.434
5	7 21 21.25	2.2692	21 3 54.8	1.548
6	7 23 37.44	2.2705	21 2 18.5	1.662
7	7 25 53.71	2.2717	21 0 35.3	1.777
8	7 28 10.05	2.2730	20 58 45.2	1.892
9	7 30 26.47	2.2742	20 56 48.2	2.007
10	7 32 42.96	2.2753	20 54 44.3	2.122
11	7 34 59.51	2.2764	20 52 33.5	2.237
12	7 37 16.13	2.2775	20 50 15.8	2.352
13	7 39 32.81	2.2784	20 47 51.2	2.467
14	7 41 49.54	2.2792	20 45 19.7	2.582
15	7 44 6.32	2.2801	20 42 41.3	2.698
16	7 46 23.15	2.2809	20 39 55.9	2.814
17	7 48 40.03	2.2817	20 37 3.6	2.929
18	7 50 56.95	2.2824	20 34 4.4	3.044
19	7 53 13.91	2.2830	20 30 58.3	3.159
20	7 55 30.91	2.2836	20 27 45.3	3.274
21	7 57 47.94	2.2841	20 24 25.4	3.389
22	8 0 5.00	2.2845	20 20 58.6	3.504
23	8 2 22.08	2.2849	N.20 17 24.9	3.618
	MONDAY 6.			
0	8 4 39.19	2.2853	N.20 13 44.4	3.733
1	8 6 56.32	2.2856	20 9 57.0	3.848
2	8 9 13.46	2.2859	20 6 2.7	3.963
3	8 11 30.62	2.2861	20 2 1.5	4.077
4	8 13 47.79	2.2862	19 57 53.5	4.190
5	8 16 4.97	2.2863	19 53 38.7	4.303
6	8 18 22.15	2.2863	19 49 17.1	4.417
7	8 20 39.33	2.2863	19 44 48.7	4.530
8	8 22 56.51	2.2863	19 40 13.5	4.643
9	8 25 13.69	2.2862	19 35 31.5	4.756
10	8 27 30.86	2.2861	19 30 42.7	4.869
11	8 29 48.02	2.2859	19 25 47.2	4.981
12	8 32 5.17	2.2857	19 20 45.0	5.092
13	8 34 22.30	2.2854	19 15 36.1	5.204
14	8 36 39.41	2.2850	19 10 20.5	5.316
15	8 38 56.50	2.2846	19 4 58.2	5.427
16	8 41 13.56	2.2842	18 59 29.3	5.537
17	8 43 30.60	2.2838	18 53 53.8	5.647
18	8 45 47.61	2.2833	18 48 11.7	5.757
19	8 48 4.59	2.2827	18 42 23.0	5.866
20	8 50 21.53	2.2820	18 36 27.8	5.974
21	8 52 38.43	2.2813	18 30 26.1	6.083
22	8 54 55.29	2.2806	18 24 17.9	6.191
23	8 57 12.11	2.2799	18 18 3.2	6.298
24	8 59 28.88	2.2791	N.18 11 42.1	6.405
	TUESDAY 7.			
	h m s	s	° ′ ″	″
0	8 59 28.88	2.2791	N.18 11 42.1	6.405
1	9 1 45.60	2.2784	18 5 14.6	6.512
2	9 4 2.28	2.2776	17 58 40.7	6.617
3	9 6 18.91	2.2767	17 52 0.5	6.722
4	9 8 35.49	2.2758	17 45 14.0	6.827
5	9 10 52.01	2.2748	17 38 21.2	6.932
6	9 13 8.47	2.2738	17 31 22.2	7.035
7	9 15 24.87	2.2728	17 24 17.0	7.138
8	9 17 41.21	2.2718	17 17 5.6	7.241
9	9 19 57.49	2.2707	17 9 48.1	7.342
10	9 22 13.70	2.2697	17 2 24.5	7.443
11	9 24 29.85	2.2686	16 54 54.9	7.543
12	9 26 45.93	2.2674	16 47 19.3	7.643
13	9 29 1.94	2.2662	16 39 37.7	7.743
14	9 31 17.88	2.2650	16 31 50.2	7.842
15	9 33 33.74	2.2638	16 23 56.7	7.940
16	9 35 49.53	2.2626	16 15 57.4	8.036
17	9 38 5.25	2.2613	16 7 52.4	8.132
18	9 40 20.89	2.2600	15 59 41.6	8.228
19	9 42 36.45	2.2587	15 51 25.1	8.323
20	9 44 51.93	2.2574	15 43 2.9	8.418
21	9 47 7.34	2.2561	15 34 35.0	8.512
22	9 49 22.67	2.2547	15 26 1.5	8.604
23	9 51 37.91	2.2533	N.15 17 22.5	8.695
	WEDNESDAY 8.			
0	9 53 53.06	2.2519	N.15 8 38.1	8.786
1	9 56 8.13	2.2505	14 59 48.2	8.876
2	9 58 23.12	2.2492	14 50 53.0	8.965
3	10 0 38.03	2.2478	14 41 52.4	9.054
4	10 2 52.85	2.2463	14 32 46.5	9.142
5	10 5 7.59	2.2449	14 23 35.4	9.228
6	10 7 22.24	2.2434	14 14 19.1	9.314
7	10 9 36.80	2.2419	14 4 57.7	9.399
8	10 11 51.27	2.2405	13 55 31.2	9.483
9	10 14 5.66	2.2391	13 45 59.7	9.567
10	10 16 19.96	2.2376	13 36 23.2	9.649
11	10 18 34.17	2.2362	13 26 41.8	9.730
12	10 20 48.30	2.2347	13 16 55.6	9.810
13	10 23 2.34	2.2332	13 7 4.6	9.890
14	10 25 16.29	2.2317	12 57 8.8	9.969
15	10 27 30.15	2.2303	12 47 8.3	10.047
16	10 29 43.93	2.2289	12 37 3.2	10.123
17	10 31 57.62	2.2274	12 26 53.5	10.199
18	10 34 11.22	2.2260	12 16 39.3	10.273
19	10 36 24.74	2.2246	12 6 20.7	10.347
20	10 38 38.17	2.2231	11 55 57.6	10.421
21	10 40 51.51	2.2217	11 45 30.2	10.493
22	10 43 4.77	2.2203	11 34 58.5	10.563
23	10 45 17.95	2.2189	11 24 22.6	10.632
24	10 47 31.04	2.2175	N.11 13 42.6	10.701

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute
	THURSDAY 9.			
	h m s	s	° ′ ″	″
0	10 47 31.04	2.2175	N. 11 13 42.6	10.701
1	10 49 44.05	2.2162	11 2 58.5	10.769
2	10 51 56.98	2.2148	10 52 10.3	10.836
3	10 54 9.83	2.2135	10 41 18.2	10.901
4	10 56 22.60	2.2122	10 30 22.2	10.966
5	10 58 35.29	2.2109	10 19 22.3	11.029
6	11 0 47.91	2.2096	10 8 18.7	11.091
7	11 3 0.45	2.2083	9 57 11.4	11.153
8	11 5 12.91	2.2071	9 46 0.4	11.214
9	11 7 25.30	2.2059	9 34 45.7	11.274
10	11 9 37.62	2.2046	9 23 27.5	11.332
11	11 11 49.86	2.2034	9 12 5.9	11.388
12	11 14 2.03	2.2023	9 0 41.0	11.444
13	11 16 14.14	2.2012	8 49 12.7	11.499
14	11 18 26.18	2.2001	8 37 41.1	11.552
15	11 20 38.15	2.1990	8 26 6.4	11.604
16	11 22 50.06	2.1980	8 14 28.6	11.656
17	11 25 1.91	2.1970	8 2 47.7	11.707
18	11 27 13.70	2.1960	7 51 3.7	11.757
19	11 29 25.43	2.1950	7 39 16.8	11.805
20	11 31 37.10	2.1941	7 27 27.1	11.852
21	11 33 48.72	2.1932	7 15 34.6	11.897
22	11 36 0.29	2.1924	7 3 39.4	11.942
23	11 38 11.81	2.1915	N. 6 51 41.5	11.986
	FRIDAY 10.			
0	11 40 23.27	2.1907	N. 6 39 41.1	12.028
1	11 42 34.69	2.1899	6 27 38.2	12.069
2	11 44 46.06	2.1892	6 15 32.8	12.110
3	11 46 57.39	2.1885	6 3 25.0	12.149
4	11 49 8.68	2.1878	5 51 14.9	12.187
5	11 51 19.93	2.1872	5 39 2.6	12.223
6	11 53 31.15	2.1867	5 26 48.2	12.258
7	11 55 42.33	2.1861	5 14 31.7	12.293
8	11 57 53.48	2.1856	5 2 13.1	12.326
9	12 0 4.60	2.1851	4 49 52.6	12.357
10	12 2 15.69	2.1847	4 37 30.2	12.388
11	12 4 26.76	2.1843	4 25 6.0	12.417
12	12 6 37.81	2.1840	4 12 40.1	12.446
13	12 8 48.84	2.1837	4 0 12.5	12.473
14	12 10 59.85	2.1833	3 47 43.3	12.499
15	12 13 10.84	2.1831	3 35 12.6	12.524
16	12 15 21.82	2.1829	3 22 40.4	12.547
17	12 17 32.79	2.1828	3 10 6.9	12.569
18	12 19 43.76	2.1827	2 57 32.1	12.591
19	12 21 54.72	2.1827	2 44 56.0	12.611
20	12 24 5.68	2.1827	2 32 18.8	12.629
21	12 26 16.64	2.1827	2 19 40.5	12.647
22	12 28 27.61	2.1828	2 7 1.1	12.664
23	12 30 38.58	2.1829	1 54 20.8	12.678
24	12 32 49.56	2.1831	N. 1 41 39.7	12.692

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute
	SATURDAY 11.			
	h m s	s	° ′ ″	″
0	12 32 49.56	2.1831	N. 1 41 39.7	12.692
1	12 35 0.55	2.1833	1 28 57.8	12.705
2	12 37 11.56	2.1836	1 16 15.1	12.717
3	12 39 22.58	2.1839	1 3 31.8	12.727
4	12 41 33.63	2.1843	0 50 47.9	12.736
5	12 43 44.70	2.1847	0 38 3.5	12.743
6	12 45 55.79	2.1851	0 25 18.7	12.749
7	12 48 6.91	2.1856	N. 0 12 33.6	12.755
8	12 50 18.07	2.1862	S. 0 0 11.9	12.760
9	12 52 29.26	2.1868	0 12 57.6	12.763
10	12 54 40.49	2.1875	0 25 43.4	12.764
11	12 56 51.76	2.1882	0 38 29.3	12.765
12	12 59 3.07	2.1889	0 51 15.2	12.764
13	13 1 14.43	2.1897	1 4 1.0	12.762
14	13 3 25.84	2.1906	1 16 46.6	12.758
15	13 5 37.30	2.1915	1 29 32.0	12.753
16	13 7 48.82	2.1925	1 42 17.0	12.748
17	13 10 0.40	2.1934	1 55 1.7	12.741
18	13 12 12.03	2.1944	2 7 45.9	12.732
19	13 14 23.73	2.1956	2 20 29.5	12.722
20	13 16 35.50	2.1967	2 33 12.6	12.712
21	13 18 47.34	2.1979	2 45 55.0	12.700
22	13 20 59.25	2.1992	2 58 36.6	12.687
23	13 23 11.24	2.2004	S. 3 11 17.4	12.673
	SUNDAY 12.			
0	13 25 23.30	2.2017	S. 3 23 57.3	12.657
1	13 27 35.45	2.2031	3 36 36.2	12.639
2	13 29 47.68	2.2046	3 49 14.0	12.621
3	13 32 0.00	2.2061	4 1 50.7	12.602
4	13 34 12.41	2.2077	4 14 26.2	12.581
5	13 36 24.92	2.2092	4 27 0.4	12.559
6	13 38 37.52	2.2108	4 39 33.3	12.536
7	13 40 50.22	2.2125	4 52 4.7	12.511
8	13 43 3.02	2.2142	5 4 34.6	12.486
9	13 45 15.93	2.2160	5 17 3.0	12.459
10	13 47 28.94	2.2178	5 29 29.7	12.430
11	13 49 42.07	2.2197	5 41 54.6	12.400
12	13 51 55.31	2.2217	5 54 17.7	12.370
13	13 54 8.67	2.2237	6 6 39.0	12.338
14	13 56 22.15	2.2256	6 18 58.3	12.304
15	13 58 35.74	2.2276	6 31 15.5	12.269
16	14 0 49.46	2.2297	6 43 30.6	12.234
17	14 3 3.31	2.2319	6 55 43.6	12.197
18	14 5 17.29	2.2341	7 7 54.3	12.158
19	14 7 31.40	2.2363	7 20 2.6	12.119
20	14 9 45.65	2.2386	7 32 8.6	12.079
21	14 12 0.03	2.2409	7 44 12.1	12.037
22	14 14 14.55	2.2433	7 56 13.0	11.993
23	14 16 29.22	2.2457	8 8 11.3	11.948
24	14 18 44.03	2.2481	S. 8 20 6.8	11.902

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	MONDAY 13.			
	h m s	s	° ′ ″	″
0	14 18 44.03	2.2481	S. 8 20 6.8	11.902
1	14 20 58.99	2.2506	8 31 59.5	11.855
2	14 23 14.10	2.2531	8 43 49.4	11.807
3	14 25 29.36	2.2557	8 55 36.4	11.758
4	14 27 44.78	2.2582	9 7 20.4	11.707
5	14 30 0.35	2.2608	9 19 1.3	11.655
6	14 32 16.08	2.2635	9 30 39.0	11.601
7	14 34 31.97	2.2662	9 42 13.4	11.547
8	14 36 48.03	2.2690	9 53 44.6	11.492
9	14 39 4.25	2.2718	10 5 12.4	11.434
10	14 41 20.64	2.2746	10 16 36.7	11.376
11	14 43 37.20	2.2774	10 27 57.5	11.317
12	14 45 53.93	2.2803	10 39 14.7	11.256
13	14 48 10.83	2.2832	10 50 28.2	11.193
14	14 50 27.91	2.2862	11 1 37.9	11.130
15	14 52 45.17	2.2891	11 12 43.8	11.066
16	14 55 2.60	2.2920	11 23 45.8	11.000
17	14 57 20.21	2.2951	11 34 43.8	10.932
18	14 59 38.01	2.2982	11 45 37.7	10.864
19	15 1 55.99	2.3012	11 56 27.5	10.795
20	15 4 14.16	2.3043	12 7 13.1	10.725
21	15 6 32.51	2.3074	12 17 54.5	10.653
22	15 8 51.05	2.3106	12 28 31.5	10.580
23	15 11 9.78	2.3137	S. 12 39 4.1	10.505
	TUESDAY 14.			
0	15 13 28.69	2.3168	S. 12 49 32.1	10.429
1	15 15 47.79	2.3200	12 59 55.6	10.352
2	15 18 7.09	2.3233	13 10 14.4	10.275
3	15 20 26.59	2.3266	13 20 28.6	10.197
4	15 22 46.28	2.3298	13 30 38.0	10.116
5	15 25 6.16	2.3330	13 40 42.5	10.034
6	15 27 26.24	2.3362	13 50 42.1	9.952
7	15 29 46.51	2.3395	14 0 36.7	9.868
8	15 32 6.98	2.3428	14 10 26.2	9.783
9	15 34 27.65	2.3461	14 20 10.6	9.697
10	15 36 48.52	2.3494	14 29 49.8	9.609
11	15 39 9.58	2.3527	14 39 23.7	9.520
12	15 41 30.84	2.3560	14 48 52.2	9.430
13	15 43 52.30	2.3593	14 58 15.3	9.340
14	15 46 13.96	2.3626	15 7 33.0	9.248
15	15 48 35.81	2.3659	15 16 45.1	9.154
16	15 50 57.87	2.3692	15 25 51.5	9.060
17	15 53 20.12	2.3725	15 34 52.3	8.966
18	15 55 42.57	2.3758	15 43 47.4	8.869
19	15 58 5.22	2.3791	15 52 36.6	8.771
20	16 0 28.06	2.3824	16 1 19.9	8.672
21	16 2 51.10	2.3857	16 9 57.3	8.573
22	16 5 14.34	2.3889	16 18 28.7	8.472
23	16 7 37.77	2.3921	16 26 54.0	8.370
24	16 10 1.39	2.3953	S. 16 35 13.1	8.267

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	WEDNESDAY 15.			
	h m s	s	° ′ ″	″
0	16 10 1.39	2.3953	S. 16 35 13.1	8.267
1	16 12 25.21	2.3986	16 43 26.0	8.162
2	16 14 49.22	2.4018	16 51 32.6	8.057
3	16 17 13.42	2.4049	16 59 32.9	7.952
4	16 19 37.81	2.4081	17 7 26.8	7.845
5	16 22 2.39	2.4112	17 15 14.3	7.737
6	16 24 27.15	2.4142	17 22 55.3	7.628
7	16 26 52.10	2.4173	17 30 29.7	7.517
8	16 29 17.23	2.4204	17 37 57.4	7.406
9	16 31 42.55	2.4234	17 45 18.4	7.294
10	16 34 8.04	2.4263	17 52 32.6	7.181
11	16 36 33.71	2.4293	17 59 40.1	7.067
12	16 38 59.56	2.4322	18 6 40.7	6.952
13	16 41 25.58	2.4351	18 13 34.3	6.836
14	16 43 51.77	2.4379	18 20 21.0	6.720
15	16 46 18.13	2.4408	18 27 0.7	6.602
16	16 48 44.66	2.4436	18 33 33.3	6.483
17	16 51 11.36	2.4463	18 39 58.7	6.363
18	16 53 38.22	2.4489	18 46 16.9	6.243
19	16 56 5.23	2.4515	18 52 27.9	6.122
20	16 58 32.40	2.4541	18 58 31.6	6.001
21	17 0 59.72	2.4566	19 4 28.0	5.878
22	17 3 27.19	2.4590	19 10 17.0	5.755
23	17 5 54.80	2.4614	S. 19 15 58.6	5.631
	THURSDAY 16.			
0	17 8 22.56	2.4638	S. 19 21 32.7	5.506
1	17 10 50.46	2.4661	19 26 59.3	5.380
2	17 13 18.49	2.4684	19 32 18.3	5.253
3	17 15 46.66	2.4706	19 37 29.7	5.126
4	17 18 14.96	2.4727	19 42 33.4	4.998
5	17 20 43.38	2.4747	19 47 29.4	4.870
6	17 23 11.92	2.4767	19 52 17.8	4.742
7	17 25 40.58	2.4786	19 56 58.4	4.612
8	17 28 9.35	2.4804	20 1 31.2	4.481
9	17 30 38.23	2.4822	20 5 56.1	4.350
10	17 33 7.22	2.4840	20 10 13.2	4.219
11	17 35 36.31	2.4856	20 14 22.4	4.087
12	17 38 5.49	2.4871	20 18 23.6	3.954
13	17 40 34.76	2.4886	20 22 16.9	3.821
14	17 43 4.12	2.4901	20 26 2.2	3.687
15	17 45 33.57	2.4915	20 29 39.4	3.553
16	17 48 3.10	2.4927	20 33 8.6	3.419
17	17 50 32.70	2.4938	20 36 29.7	3.284
18	17 53 2.36	2.4949	20 39 42.7	3.149
19	17 55 32.09	2.4960	20 42 47.6	3.013
20	17 58 1.88	2.4969	20 45 44.3	2.877
21	18 0 31.72	2.4978	20 48 32.9	2.741
22	18 3 1.61	2.4986	20 51 13.3	2.604
23	18 5 31.55	2.4993	20 53 45.4	2.467
24	18 8 1.53	2.4999	S. 20 56 9.3	2.330

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	FRIDAY 17.			
	h m s	s	° ′ ″	″
0	18 8 1.53	2.4999	S. 20 56 9.3	2.330
1	18 10 31.54	2.5004	20 58 25.0	2.192
2	18 13 1.58	2.5008	21 0 32.4	2.055
3	18 15 31.64	2.5012	21 2 31.6	1.917
4	18 18 1.72	2.5014	21 4 22.5	1.779
5	18 20 31.81	2.5016	21 6 5.1	1.642
6	18 23 1.91	2.5017	21 7 39.5	1.504
7	18 25 32.01	2.5017	21 9 5.6	1.365
8	18 28 2.11	2.5016	21 10 23.3	1.226
9	18 30 32.20	2.5014	21 11 32.7	1.087
10	18 33 2.28	2.5012	21 12 33.8	0.949
11	18 35 32.34	2.5008	21 13 26.6	0.810
12	18 38 2.37	2.5003	21 14 11.0	0.672
13	18 40 32.37	2.4997	21 14 47.2	0.534
14	18 43 2.34	2.4991	21 15 15.1	0.395
15	18 45 32.26	2.4983	21 15 34.6	0.256
16	18 48 2.13	2.4975	21 15 45.8	− 0.118
17	18 50 31.95	2.4966	21 15 48.8	+ 0.019
18	18 53 1.72	2.4956	21 15 43.5	0.157
19	18 55 31.42	2.4944	21 15 29.9	0.295
20	18 58 1.05	2.4932	21 15 8.1	0.432
21	19 0 30.61	2.4920	21 14 38.0	0.570
22	19 3 0.09	2.4906	21 13 59.7	0.707
23	19 5 29.48	2.4890	S. 21 13 13.2	0.843
	SATURDAY 18.			
0	19 7 58.77	2.4874	S. 21 12 18.5	0.980
1	19 10 27.97	2.4858	21 11 15.6	1.116
2	19 12 57.07	2.4841	21 10 4.6	1.252
3	19 15 26.06	2.4822	21 8 45.4	1.388
4	19 17 54.94	2.4803	21 7 18.1	1.523
5	19 20 23.70	2.4783	21 5 42.7	1.658
6	19 22 52.34	2.4762	21 3 59.2	1.792
7	19 25 20.85	2.4741	21 2 7.7	1.925
8	19 27 49.23	2.4718	21 0 8.2	2.058
9	19 30 17.47	2.4695	20 58 0.7	2.191
10	19 32 45.57	2.4670	20 55 45.3	2.323
11	19 35 13.51	2.4644	20 53 22.0	2.455
12	19 37 41.30	2.4618	20 50 50.7	2.587
13	19 40 8.93	2.4592	20 48 11.6	2.717
14	19 42 36.40	2.4564	20 45 24.7	2.846
15	19 45 3.70	2.4536	20 42 30.1	2.975
16	19 47 30.83	2.4507	20 39 27.7	3.104
17	19 49 57.79	2.4478	20 36 17.6	3.232
18	19 52 24.57	2.4447	20 32 59.8	3.360
19	19 54 51.16	2.4416	20 29 34.4	3.486
20	19 57 17.56	2.4383	20 26 1.5	3.612
21	19 59 43.76	2.4350	20 22 21.0	3.737
22	20 2 9.76	2.4317	20 18 33.0	3.862
23	20 4 35.56	2.4283	20 14 37.6	3.985
24	20 7 1.16	2.4249	S. 20 10 34.8	4.108

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SUNDAY 19.			
	h m s	s	° ′ ″	″
0	20 7 1.16	2.4249	S. 20 10 34.8	4.108
1	20 9 26.55	2.4213	20 6 24.6	4.230
2	20 11 51.72	2.4176	20 2 7.2	4.351
3	20 14 16.66	2.4139	19 57 42.5	4.472
4	20 16 41.38	2.4102	19 53 10.6	4.591
5	20 19 5.88	2.4064	19 48 31.6	4.709
6	20 21 30.15	2.4026	19 43 45.5	4.827
7	20 23 54.19	2.3987	19 38 52.4	4.944
8	20 26 17.99	2.3947	19 33 52.2	5.061
9	20 28 41.55	2.3907	19 28 45.1	5.176
10	20 31 4.87	2.3866	19 23 31.1	5.290
11	20 33 27.94	2.3825	19 18 10.3	5.402
12	20 35 50.77	2.3783	19 12 42.8	5.514
13	20 38 13.34	2.3741	19 7 8.6	5.626
14	20 40 35.66	2.3698	19 1 27.7	5.737
15	20 42 57.72	2.3655	18 55 40.2	5.846
16	20 45 19.52	2.3612	18 49 46.2	5.953
17	20 47 41.06	2.3568	18 43 45.8	6.060
18	20 50 2.34	2.3524	18 37 39.0	6.167
19	20 52 23.35	2.3479	18 31 25.8	6.272
20	20 54 44.09	2.3433	18 25 6.3	6.376
21	20 57 4.55	2.3388	18 18 40.7	6.479
22	20 59 24.74	2.3343	18 12 8.9	6.581
23	21 1 44.66	2.3297	S. 18 5 31.0	6.682
	MONDAY 20.			
0	21 4 4.31	2.3251	S. 17 58 47.1	6.781
1	21 6 23.68	2.3204	17 51 57.3	6.880
2	21 8 42.76	2.3157	17 45 1.5	6.978
3	21 11 1.56	2.3110	17 37 59.9	7.075
4	21 13 20.08	2.3062	17 30 52.5	7.170
5	21 15 38.31	2.3015	17 23 39.5	7.263
6	21 17 56.26	2.2967	17 16 20.9	7.356
7	21 20 13.92	2.2919	17 8 56.8	7.448
8	21 22 31.29	2.2872	17 1 27.1	7.540
9	21 24 48.38	2.2824	16 53 52.0	7.629
10	21 27 5.18	2.2776	16 46 11.6	7.718
11	21 29 21.69	2.2727	16 38 25.9	7.806
12	21 31 37.90	2.2678	16 30 34.9	7.893
13	21 33 53.82	2.2629	16 22 38.8	7.978
14	21 36 9.45	2.2581	16 14 37.6	8.061
15	21 38 24.79	2.2532	16 6 31.5	8.144
16	21 40 39.84	2.2483	15 58 20.4	8.226
17	21 42 54.59	2.2434	15 50 4.4	8.307
18	21 45 9.05	2.2386	15 41 43.6	8.386
19	21 47 23.22	2.2337	15 33 18.1	8.464
20	21 49 37.09	2.2288	15 24 47.9	8.542
21	21 51 50.67	2.2239	15 16 13.1	8.618
22	21 54 3.96	2.2190	15 7 33.8	8.693
23	21 56 16.95	2.2141	14 58 50.0	8.766
24	21 58 29.65	2.2092	S. 14 50 1.9	8.838

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute
	TUESDAY 21.			
	h m s	s	° ′ ″	″
0	21 58 29.65	2.2092	S. 14 50 1.9	8.838
1	22 0 42.06	2.2044	14 41 9.5	8.909
2	22 2 54.18	2.1996	14 32 12.8	8.980
3	22 5 6.01	2.1947	14 23 11.9	9.049
4	22 7 17.55	2.1899	14 14 6.9	9.117
5	22 9 28.80	2.1852	14 4 57.9	9.183
6	22 11 39.77	2.1804	13 55 45.0	9.248
7	22 13 50.45	2.1756	13 46 28.1	9.313
8	22 16 0.84	2.1708	13 37 7.4	9.376
9	22 18 10.94	2.1660	13 27 43.0	9.438
10	22 20 20.76	2.1613	13 18 14.9	9.499
11	22 22 30.30	2.1566	13 8 43.1	9.559
12	22 24 39.55	2.1518	12 59 7.8	9.617
13	22 26 48.52	2.1472	12 49 29.0	9.675
14	22 28 57.21	2.1426	12 39 46.8	9.732
15	22 31 5.63	2.1380	12 30 1.2	9.787
16	22 33 13.77	2.1334	12 20 12.3	9.841
17	22 35 21.64	2.1288	12 10 20.3	9.894
18	22 37 29.23	2.1242	12 0 25.1	9.946
19	22 39 36.55	2.1197	11 50 26.8	9.997
20	22 41 43.60	2.1152	11 40 25.5	10.046
21	22 43 50.38	2.1107	11 30 21.3	10.094
22	22 45 56.89	2.1063	11 20 14.2	10.142
23	22 48 3.14	2.1020	S. 11 10 4.2	10.189
	WEDNESDAY 22.			
0	22 50 9.13	2.0977	S. 10 59 51.5	10.234
1	22 52 14.86	2.0933	10 49 36.1	10.278
2	22 54 20.33	2.0890	10 39 18.1	10.322
3	22 56 25.54	2.0847	10 28 57.5	10.364
4	22 58 30.50	2.0805	10 18 34.4	10.405
5	23 0 35.20	2.0763	10 8 8.9	10.444
6	23 2 39.65	2.0722	9 57 41.1	10.483
7	23 4 43.86	2.0681	9 47 10.9	10.521
8	23 6 47.82	2.0639	9 36 38.5	10.558
9	23 8 51.53	2.0598	9 26 3.9	10.594
10	23 10 55.00	2.0558	9 15 27.2	10.629
11	23 12 58.23	2.0519	9 4 48.4	10.663
12	23 15 1.23	2.0481	8 54 7.6	10.696
13	23 17 4.00	2.0442	8 43 24.9	10.727
14	23 19 6.53	2.0403	8 32 40.4	10.758
15	23 21 8.83	2.0364	8 21 54.0	10.788
16	23 23 10.90	2.0327	8 11 5.8	10.817
17	23 25 12.75	2.0290	8 0 16.0	10.844
18	23 27 14.38	2.0253	7 49 24.5	10.871
19	23 29 15.79	2.0217	7 38 31.5	10.897
20	23 31 16.98	2.0181	7 27 36.9	10.922
21	23 33 17.96	2.0146	7 16 40.9	10.945
22	23 35 18.73	2.0111	7 5 43.5	10.968
23	23 37 19.29	2.0076	6 54 44.7	10.991
24	23 39 19.64	2.0042	S. 6 43 44.6	11.012

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	THURSDAY 23.			
	h m s	s	° ′ ″	″
0	23 39 19.64	2.0042	S. 6 43 44.6	11.012
1	23 41 19.79	2.0008	6 32 43.3	11.031
2	23 43 19.74	1.9975	6 21 40.9	11.050
3	23 45 19.49	1.9942	6 10 37.3	11.069
4	23 47 19.05	1.9910	5 59 32.6	11.086
5	23 49 18.41	1.9878	5 48 27.0	11.102
6	23 51 17.58	1.9847	5 37 20.4	11.117
7	23 53 16.57	1.9817	5 26 12.9	11.132
8	23 55 15.38	1.9786	5 15 4.6	11.146
9	23 57 14.00	1.9756	5 3 55.4	11.160
10	23 59 12.45	1.9727	4 52 45.4	11.172
11	0 1 10.72	1.9698	4 41 34.8	11.182
12	0 3 8.82	1.9669	4 30 23.6	11.192
13	0 5 6.75	1.9641	4 19 11.8	11.201
14	0 7 4.52	1.9614	4 7 59.5	11.210
15	0 9 2.12	1.9587	3 56 46.6	11.218
16	0 10 59.56	1.9561	3 45 33.3	11.225
17	0 12 56.85	1.9535	3 34 19.6	11.231
18	0 14 53.98	1.9509	3 23 5.6	11.236
19	0 16 50.96	1.9484	3 11 51.3	11.240
20	0 18 47.79	1.9460	3 0 36.8	11.244
21	0 20 44.48	1.9437	2 49 22.1	11.247
22	0 22 41.03	1.9413	2 38 7.2	11.248
23	0 24 37.44	1.9390	S. 2 26 52.3	11.249
	FRIDAY 24.			
0	0 26 33.71	1.9368	S. 2 15 37.3	11.250
1	0 28 29.85	1.9346	2 4 22.3	11.249
2	0 30 25.86	1.9325	1 53 7.4	11.248
3	0 32 21.75	1.9304	1 41 52.5	11.246
4	0 34 17.51	1.9283	1 30 37.8	11.243
5	0 36 13.15	1.9264	1 19 23.3	11.240
6	0 38 8.68	1.9245	1 8 9.0	11.236
7	0 40 4.09	1.9226	0 56 55.0	11.231
8	0 41 59.39	1.9207	0 45 41.3	11.225
9	0 43 54.58	1.9189	0 34 28.0	11.218
10	0 45 49.66	1.9172	0 23 15.1	11.211
11	0 47 44.65	1.9156	0 12 2.6	11.204
12	0 49 39.54	1.9140	S. 0 0 50.6	11.196
13	0 51 34.33	1.9124	N. 0 10 20.9	11.186
14	0 53 29.03	1.9109	0 21 31.7	11.175
15	0 55 23.64	1.9095	0 32 41.9	11.164
16	0 57 18.17	1.9081	0 43 51.4	11.153
17	0 59 12.61	1.9067	0 55 0.2	11.141
18	1 1 6.97	1.9054	1 6 8.3	11.128
19	1 3 1.26	1.9042	1 17 15.6	11.114
20	1 4 55.47	1.9029	1 28 22.0	11.100
21	1 6 49.61	1.9017	1 39 27.6	11.086
22	1 8 43.68	1.9007	1 50 32.3	11.070
23	1 10 37.69	1.8997	2 1 36.0	11.053
24	1 12 31.64	1.8987	N. 2 12 38.6	11.035

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY 25.			
	h m s	s	° ′ ″	″
0	1 12 31.64	1.8987	N. 2 12 38.6	11.035
1	1 14 25.53	1.8977	2 23 40.2	11.018
2	1 16 19.37	1.8968	2 34 40.8	11.001
3	1 18 13.15	1.8959	2 45 40.3	10.983
4	1 20 6.88	1.8951	2 56 38.7	10.963
5	1 22 0.57	1.8944	3 7 35.8	10.942
6	1 23 54.21	1.8937	3 18 31.7	10.921
7	1 25 47.81	1.8931	3 29 26.3	10.899
8	1 27 41.38	1.8926	3 40 19.6	10.877
9	1 29 34.92	1.8921	3 51 11.6	10.855
10	1 31 28.43	1.8916	4 2 2.2	10.832
11	1 33 21.91	1.8911	4 12 51.4	10.807
12	1 35 15.36	1.8907	4 23 39.1	10.782
13	1 37 8.79	1.8904	4 34 25.3	10.757
14	1 39 2.20	1.8901	4 45 10.0	10.732
15	1 40 55.60	1.8898	4 55 53.1	10.705
16	1 42 48.98	1.8897	5 6 34.6	10.678
17	1 44 42.36	1.8896	5 17 14.5	10.651
18	1 46 35.73	1.8894	5 27 52.7	10.622
19	1 48 29.09	1.8894	5 38 29.2	10.593
20	1 50 22.46	1.8895	5 49 3.9	10.563
21	1 52 15.83	1.8896	5 59 36.8	10.533
22	1 54 9.21	1.8897	6 10 7.9	10.503
23	1 56 2.59	1.8898	N. 6 20 37.1	10.472
	SUNDAY 26.			
0	1 57 55.98	1.8900	N. 6 31 4.5	10.441
1	1 59 49.39	1.8903	6 41 30.0	10.408
2	2 1 42.82	1.8906	6 51 53.5	10.374
3	2 3 36.26	1.8909	7 2 14.9	10.340
4	2 5 29.73	1.8913	7 12 34.3	10.306
5	2 7 23.22	1.8917	7 22 51.6	10.271
6	2 9 16.74	1.8922	7 33 6.8	10.236
7	2 11 10.29	1.8928	7 43 19.9	10.201
8	2 13 3.88	1.8934	7 53 30.9	10.165
9	2 14 57.50	1.8941	8 3 39.7	10.127
10	2 16 51.17	1.8948	8 13 46.2	10.089
11	2 18 44.88	1.8955	8 23 50.4	10.051
12	2 20 38.63	1.8962	8 33 52.3	10.012
13	2 22 32.43	1.8971	8 43 51.8	9.973
14	2 24 26.28	1.8980	8 53 49.0	9.933
15	2 26 20.19	1.8989	9 3 43.8	9.892
16	2 28 14.15	1.8998	9 13 36.1	9.851
17	2 30 8.17	1.9008	9 23 25.9	9.810
18	2 32 2.25	1.9019	9 33 13.3	9.768
19	2 33 56.40	1.9031	9 42 58.1	9.725
20	2 35 50.62	1.9042	9 52 40.3	9.681
21	2 37 44.90	1.9054	10 2 19.9	9.637
22	2 39 39.26	1.9066	10 11 56.8	9.593
23	2 41 33.69	1.9079	10 21 31.1	9.549
24	2 43 28.20	1.9092	N.10 31 2.7	9.503
	MONDAY 27.			
0	2 43 28.20	1.9092	N.10 31 2.7	9.503
1	2 45 22.79	1.9105	10 40 31.5	9.457
2	2 47 17.46	1.9119	10 49 57.5	9.411
3	2 49 12.22	1.9134	10 59 20.8	9.364
4	2 51 7.07	1.9149	11 8 41.2	9.316
5	2 53 2.01	1.9164	11 17 58.7	9.267
6	2 54 57.04	1.9180	11 27 13.2	9.217
7	2 56 52.17	1.9196	11 36 24.8	9.168
8	2 58 47.39	1.9212	11 45 33.4	9.119
9	3 0 42.71	1.9229	11 54 39.1	9.069
10	3 2 38.14	1.9247	12 3 41.7	9.017
11	3 4 33.67	1.9264	12 12 41.2	8.965
12	3 6 29.31	1.9282	12 21 37.5	8.912
13	3 8 25.06	1.9301	12 30 30.7	8.860
14	3 10 20.92	1.9319	12 39 20.7	8.807
15	3 12 16.89	1.9338	12 48 7.6	8.754
16	3 14 12.98	1.9358	12 56 51.2	8.699
17	3 16 9.19	1.9378	13 5 31.5	8.643
18	3 18 5.52	1.9398	13 14 8.4	8.587
19	3 20 1.97	1.9419	13 22 42.0	8.532
20	3 21 58.55	1.9441	13 31 12.2	8.476
21	3 23 55.26	1.9462	13 39 39.1	8.419
22	3 25 52.10	1.9484	13 48 2.5	8.361
23	3 27 49.07	1.9506	N.13 56 22.4	8.302
	TUESDAY 28.			
0	3 29 46.17	1.9528	N.14 4 38.8	8.243
1	3 31 43.41	1.9551	14 12 51.6	8.183
2	3 33 40.79	1.9574	14 21 0.8	8.123
3	3 35 38.30	1.9597	14 29 6.4	8.063
4	3 37 35.95	1.9621	14 37 8.4	8.002
5	3 39 33.75	1.9646	14 45 6.7	7.941
6	3 41 31.70	1.9670	14 53 1.3	7.878
7	3 43 29.79	1.9694	15 0 52.1	7.815
8	3 45 28.03	1.9720	15 8 39.1	7.752
9	3 47 26.43	1.9746	15 16 22.4	7.689
10	3 49 24.98	1.9771	15 24 1.8	7.624
11	3 51 23.68	1.9796	15 31 37.2	7.558
12	3 53 22.53	1.9822	15 39 8.7	7.493
13	3 55 21.54	1.9848	15 46 36.3	7.427
14	3 57 20.71	1.9875	15 53 59.9	7.359
15	3 59 20.04	1.9902	16 1 19.4	7.292
16	4 1 19.54	1.9930	16 8 34.9	7.224
17	4 3 19.20	1.9958	16 15 46.3	7.155
18	4 5 19.03	1.9986	16 22 53.5	7.086
19	4 7 19.03	2.0013	16 29 56.6	7.017
20	4 9 19.19	2.0041	16 36 55.5	6.946
21	4 11 19.52	2.0069	16 43 50.1	6.875
22	4 13 20.02	2.0098	16 50 40.5	6.804
23	4 15 20.69	2.0127	16 57 26.6	6.732
24	4 17 21.54	2.0156	N.17 4 8.3	6.659

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 29.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	4 17 21.54	2.0156	N.17 4 8.3	6.659
1	4 19 22.56	2.0185	17 10 45.7	6.586
2	4 21 23.76	2.0214	17 17 18.6	6.512
3	4 23 25.13	2.0243	17 23 47.1	6.437
4	4 25 26.68	2.0273	17 30 11.1	6.362
5	4 27 28.41	2.0303	17 36 30.6	6.287
6	4 29 30.32	2.0333	17 42 45.6	6.212
7	4 31 32.41	2.0363	17 48 56.0	6.135
8	4 33 34.68	2.0394	17 55 1.8	6.057
9	4 35 37.14	2.0425	18 1 2.9	5.979
10	4 37 39.78	2.0455	18 6 59.3	5.901
11	4 39 42.60	2.0486	18 12 51.0	5.822
12	4 41 45.61	2.0517	18 18 37.9	5.742
13	4 43 48.80	2.0548	18 24 20.0	5.662
14	4 45 52.18	2.0579	18 29 57.3	5.582
15	4 47 55.75	2.0610	18 35 29.8	5.500
16	4 49 59.50	2.0641	18 40 57.3	5.418
17	4 52 3.44	2.0672	18 46 19.9	5.336
18	4 54 7.57	2.0704	18 51 37.6	5.253
19	4 56 11.89	2.0736	18 56 50.2	5.169
20	4 58 16.40	2.0767	19 1 57.8	5.085
21	5 0 21.10	2.0798	19 7 0.4	5.001
22	5 2 25.98	2.0829	19 11 57.9	4.915
23	5 4 31.05	2.0861	N.19 16 50.2	4.828

THURSDAY 30.

0	5 6 36.31	2.0892	N.19 21 37.3	4.742
1	5 8 41.76	2.0924	19 26 19.2	4.655
2	5 10 47.40	2.0957	19 30 55.9	4.567
3	5 12 53.24	2.0989	19 35 27.3	4.479
4	5 14 59.27	2.1020	19 39 53.4	4.390
5	5 17 5.48	2.1051	19 44 14.1	4.300
6	5 19 11.88	2.1083	19 48 29.4	4.210
7	5 21 18.48	2.1115	19 52 39.3	4.120
8	5 23 25.26	2.1146	19 56 43.8	4.029
9	5 25 32.23	2.1177	20 0 42.8	3.937
10	5 27 39.39	2.1209	20 4 36.3	3.845
11	5 29 46.74	2.1240	20 8 24.2	3.753
12	5 31 54.27	2.1271	20 12 6.6	3.660
13	5 34 1.99	2.1302	20 15 43.4	3.566
14	5 36 9.90	2.1334	20 19 14.5	3.471
15	5 38 18.00	2.1365	20 22 39.9	3.376
16	5 40 26.28	2.1395	20 25 59.6	3.281
17	5 42 34.74	2.1426	20 29 13.6	3.185
18	5 44 43.39	2.1457	20 32 21.8	3.088
19	5 46 52.22	2.1487	20 35 24.2	2.991
20	5 49 1.23	2.1517	20 38 20.7	2.894
21	5 51 10.43	2.1547	20 41 11.4	2.796
22	5 53 19.80	2.1577	20 43 56.2	2.697
23	5 55 29.35	2.1607	20 46 35.0	2.597
24	5 57 39.08	2.1637	N.20 49 7.9	2.498

FRIDAY 31.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	5 57 39.08	2.1637	N.20 49 7.9	2.498
1	5 59 48.99	2.1666	20 51 34.8	2.398
2	6 1 59.07	2.1695	20 53 55.7	2.297
3	6 4 9.33	2.1724	20 56 10.5	2.196
4	6 6 19.76	2.1752	20 58 19.2	2.094
5	6 8 30.36	2.1781	21 0 21.8	1.992
6	6 10 41.13	2.1809	21 2 18.3	1.890
7	6 12 52.07	2.1837	21 4 8.6	1.788
8	6 15 3.18	2.1865	21 5 52.8	1.684
9	6 17 14.45	2.1892	21 7 30.7	1.579
10	6 19 25.88	2.1919	21 9 2.3	1.475
11	6 21 37.48	2.1946	21 10 27.7	1.371
12	6 23 49.24	2.1973	21 11 46.8	1.266
13	6 26 1.16	2.2000	21 12 59.6	1.160
14	6 28 13.24	2.2026	21 14 6.0	1.053
15	6 30 25.47	2.2051	21 15 6.0	0.947
16	6 32 37.85	2.2076	21 15 59.6	0.840
17	6 34 50.38	2.2102	21 16 46.8	0.732
18	6 37 3.07	2.2127	21 17 27.5	0.625
19	6 39 15.91	2.2151	21 18 1.8	0.517
20	6 41 28.89	2.2175	21 18 29.5	0.408
21	6 43 42.01	2.2198	21 18 50.7	0.299
22	6 45 55.27	2.2222	21 19 5.4	0.190
23	6 48 8.67	2.2245	N.21 19 13.5	+0.080

SATURDAY, SEPTEMBER 1.

0	6 50 22.21	2.2267	N.21 19 15.0	−0.030

PHASES OF THE MOON.

		d	h	m
●	New Moon . August	7	6	20.9
☽	First Quarter . . .	14	4	44.0
○	Full Moon	21	4	20.3
☾	Last Quarter	29	2	17.9

		d	h
☾	Perigee . . . August	14	0.2
☾	Apogee	28	0.8

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	III^{h}.	P. L. of Diff.	VI^{h}.	P. L. of Diff.	IX^{h}.	P. L. of Diff.
1	Fomalhaut	W.	83° 55′ 8″	3284	85° 19′ 38″	3280	86° 44′ 13″	3275	88° 8′ 54″	3270
	α Pegasi	W.	68 52 25	3491	70 12 59	3480	71 33 46	3469	72 54 45	3458
	α Arietis	W.	25 56 13	3977	27 8 15	3885	28 21 50	3804	29 36 48	3733
	Pollux	E.	55 10 36	3114	53 42 43	3112	52 14 48	3110	50 46 51	3109
	Sun	E.	72 4 24	3422	70 42 32	3418	69 20 36	3414	67 58 35	3409
2	Fomalhaut	W.	95 13 46	3244	96 39 3	3238	98 4 27	3232	99 29 58	3227
	α Pegasi	W.	79 42 44	3404	81 4 56	3394	82 27 19	3385	83 49 53	3374
	α Arietis	W.	36 7 50	3479	37 28 38	3442	38 50 7	3408	40 12 15	3375
	Pollux	E.	43 26 29	3097	41 58 16	3096	40 30 1	3093	39 1 43	3092
	Sun	E.	61 6 57	3378	59 44 15	3370	58 21 24	3363	56 58 25	3354
3	α Arietis	W.	47 11 27	3242	48 36 47	3218	50 2 35	3196	51 28 49	3175
	Aldebaran	W.	13 28 38	2969	14 59 29	2956	16 30 37	2944	18 2 0	2932
	Pollux	E.	31 39 59	3094	30 11 42	3098	28 43 30	3105	27 15 26	3113
	Sun	E.	50 0 57	3307	48 36 54	3297	47 12 39	3286	45 48 11	3276
4	α Arietis	W.	58 46 4	3078	60 14 41	3060	61 43 39	3043	63 12 59	3026
	Aldebaran	W.	25 42 42	2873	27 15 36	2860	28 48 46	2848	30 22 11	2836
	Sun	E.	38 42 37	3218	37 16 49	3205	35 50 46	3193	34 24 29	3181
5	α Arietis	W.	70 44 50	2944	72 16 13	2929	73 47 55	2914	75 19 56	2899
	Aldebaran	W.	38 13 15	2774	39 48 17	2762	41 23 35	2750	42 59 9	2737
	Sun	E.	27 9 17	3118	25 41 29	3105	24 13 26	3092	22 45 7	3080
9	Sun	W.	22 0 5	2741	23 35 50	2732	25 11 47	2723	26 47 56	2715
	Mars	E.	61 1 33	2643	59 23 37	2637	57 45 32	2630	56 7 18	2625
	Jupiter	E.	77 52 55	2448	76 10 28	2440	74 27 50	2432	72 45 1	2424
	Antares	E.	89 26 38	2470	87 44 43	2462	86 2 37	2455	84 20 21	2448
10	Sun	W.	34 51 20	2678	36 28 30	2672	38 5 48	2666	39 43 14	2660
	Mars	E.	47 54 23	2602	46 15 31	2599	44 36 35	2596	42 57 35	2595
	Jupiter	E.	64 8 35	2395	62 24 53	2389	60 41 3	2384	58 57 6	2380
	Antares	E.	75 46 41	2419	74 3 33	2414	72 20 18	2409	70 36 56	2405
11	Sun	W.	47 52 15	2635	49 30 23	2631	51 8 36	2626	52 46 55	2623
	Mars	E.	34 42 28	2601	33 3 34	2605	31 24 46	2612	29 46 7	2621
	Jupiter	E.	50 15 50	2362	48 31 20	2359	46 46 46	2356	45 2 8	2354
	Antares	E.	61 58 54	2391	60 15 6	2389	58 31 16	2389	56 47 25	2389
12	Sun	W.	60 59 38	2608	62 38 22	2605	64 17 10	2603	65 56 1	2601
	Jupiter	E.	36 18 27	2350	34 33 41	2351	32 48 56	2353	31 4 13	2355
	Antares	E.	48 8 17	2394	46 24 34	2398	44 40 56	2403	42 57 25	2408
13	Sun	W.	74 10 49	2595	75 49 51	2593	77 28 55	2592	79 8 1	2591
	Antares	E.	34 22 23	2457	32 40 9	2473	30 58 18	2492	29 16 54	2516
	α Aquilæ	E.	83 5 12	2889	81 32 39	2894	80 0 12	2900	78 27 53	2907
14	Sun	W.	87 23 36	2591	89 2 43	2591	90 41 50	2592	92 20 56	2593
	Spica	W.	28 1 38	2438	29 44 19	2422	31 27 22	2410	33 10 43	2399
	α Aquilæ	E.	70 49 10	2965	69 18 13	2981	67 47 36	2999	66 17 22	3020
	Fomalhaut	E.	103 45 24	2522	102 4 42	2520	100 23 56	2517	98 43 6	2515

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^h.	P. L. of Diff.	XVIII^h.	P. L. of Diff.	XXI^h.	P. L. of Diff.
1	Fomalhaut	W.	89° 33′ 40″	3265	90° 58′ 32″	3260	92° 23′ 30″	3254	93° 48′ 35″	3249
	α Pegasi	W.	74 15 56	3446	75 37 20	3436	76 58 56	3425	78 20 44	3415
	α Arietis	W.	30 53 0	3671	32 10 18	3615	33 28 36	3565	34 47 48	3520
	Pollux	E.	49 18 52	3106	47 50 50	3105	46 22 46	3102	44 54 39	3100
	Sun	E.	66 36 29	3404	65 14 17	3398	63 51 58	3391	62 29 31	3385
2	Fomalhaut	W.	100 55 35	3221	102 21 19	3215	103 47 10	3210	105 13 7	3204
	α Pegasi	W.	85 12 39	3365	86 35 36	3355	87 58 44	3345	89 22 3	3337
	α Arietis	W.	41 35 0	3345	42 58 20	3317	44 22 12	3290	45 46 35	3265
	Pollux	E.	37 33 23	3091	36 5 2	3090	34 36 40	3091	33 8 19	3092
	Sun	E.	55 35 16	3345	54 11 57	3337	52 48 28	3327	51 24 48	3318
3	α Arietis	W.	52 55 28	3155	54 22 31	3135	55 49 58	3115	57 17 49	3096
	Aldebaran	W.	19 33 38	2920	21 5 32	2908	22 37 41	2897	24 10 4	2885
	Pollux	E.	25 47 32	3124	24 19 52	3141	22 52 32	3163	21 25 39	3193
	Sun	E.	44 23 31	3265	42 58 38	3253	41 33 31	3242	40 8 11	3230
4	α Arietis	W.	64 42 40	3009	66 12 42	2993	67 43 4	2976	69 13 47	2960
	Aldebaran	W.	31 55 52	2825	33 29 48	2812	35 4 0	2799	36 38 29	2786
	Sun	E.	32 57 57	3168	31 31 10	3156	30 4 8	3143	28 36 50	3130
5	α Arietis	W.	76 52 16	2884	78 24 55	2870	79 57 52	2856	81 31 7	2842
	Aldebaran	W.	44 35 0	2724	46 11 8	2712	47 47 32	2699	49 24 13	2687
	Sun	E.	21 16 33	3068	19 47 44	3056	18 18 40	3045	16 49 23	3034
9	Sun	W.	28 24 16	2707	30 0 47	2699	31 37 28	2692	33 14 19	2684
	Mars	E.	54 28 57	2619	52 50 28	2614	51 11 52	2610	49 33 10	2606
	Jupiter	E.	71 2 1	2418	69 18 52	2412	67 35 35	2406	65 52 9	2401
	Antares	E.	82 37 55	2441	80 55 19	2435	79 12 34	2429	77 29 41	2424
10	Sun	W.	41 20 48	2655	42 58 29	2649	44 36 18	2644	46 14 13	2639
	Mars	E.	41 18 33	2594	39 39 30	2595	38 0 28	2596	36 21 27	2597
	Jupiter	E.	57 13 2	2375	55 28 52	2372	53 44 37	2368	52 0 16	2364
	Antares	E.	68 53 29	2402	67 9 57	2398	65 26 20	2396	63 42 39	2393
11	Sun	W.	54 25 19	2620	56 3 47	2616	57 42 20	2613	59 20 57	2610
	Mars	E.	28 7 40	2632	26 29 28	2645	24 51 34	2663	23 14 4	2686
	Jupiter	E.	43 17 27	2353	41 32 44	2351	39 47 59	2350	38 3 13	2350
	Antares	E.	55 3 34	2389	53 19 43	2389	51 35 52	2390	49 52 3	2392
12	Sun	W.	67 34 54	2599	69 13 50	2598	70 52 48	2596	72 31 48	2596
	Jupiter	E.	29 19 34	2358	27 34 59	2363	25 50 31	2368	24 6 11	2376
	Antares	E.	41 14 2	2415	39 30 48	2422	37 47 45	2432	36 4 56	2443
13	Sun	W.	80 47 8	2591	82 26 15	2591	84 5 22	2591	85 44 29	2591
	Antares	E.	27 36 3	2544	25 55 51	2579	24 16 27	2622	22 38 2	2678
	α Aquilæ	E.	76 55 43	2916	75 23 44	2925	73 51 57	2937	72 20 25	2950
14	Sun	W.	94 0 1	2593	95 39 5	2594	97 18 8	2595	98 57 10	2596
	Spica	W.	34 54 19	2390	36 38 8	2382	38 22 8	2376	40 6 17	2371
	α Aquilæ	E.	64 47 34	3042	63 18 13	3066	61 49 22	3094	60 21 5	3124
	Fomalhaut	E.	97 2 14	2514	95 21 20	2514	93 40 26	2514	91 59 32	2515

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	III^h.	P. L. of Diff.	VI^h.	P. L. of Diff.	IX^h.	P. L. of Diff.
15	Sun	W.	100° 36′ 10″	2598	102° 15′ 8″	2599	103° 54′ 4″	2601	105° 32′ 57″	2603
	Spica	W.	41 50 33	2367	43 34 55	2363	45 19 23	2360	47 3 55	2358
	Mars	W.	21 1 26	2687	22 38 24	2660	24 15 57	2640	25 53 58	2623
	α Aquilæ	E.	58 53 24	3157	57 26 23	3193	56 0 6	3234	54 34 37	3278
	Fomalhaut	E.	90 18 39	2516	88 37 48	2517	86 56 59	2519	85 16 12	2522
16	Sun	W.	113 46 43	2615	115 25 18	2618	117 3 49	2621	118 42 16	2624
	Spica	W.	55 47 5	2355	57 31 44	2356	59 16 22	2356	61 1 0	2357
	Mars	W.	34 8 23	2579	35 47 47	2575	37 27 16	2572	39 6 49	2571
	Jupiter	W.	20 38 29	2405	22 21 56	2398	24 5 34	2392	25 49 20	2388
	α Aquilæ	E.	47 41 49	3577	46 22 50	3659	45 5 19	3748	43 49 23	3848
	Fomalhaut	E.	76 53 33	2545	75 13 22	2551	73 33 20	2159	71 53 28	2566
	α Pegasi	E.	92 42 5	2681	91 5 0	2683	89 27 57	2686	87 50 58	2689
17	Spica	W.	69 43 28	2370	71 27 46	2373	73 12 0	2376	74 56 9	2380
	Mars	W.	47 24 52	2572	49 4 26	2573	50 43 58	2575	52 23 27	2578
	Jupiter	W.	34 29 4	2384	36 13 1	2386	37 56 56	2388	39 40 48	2391
	Antares	W.	24 40 59	2617	26 19 31	2586	27 58 45	2563	29 38 31	2544
	Fomalhaut	E.	63 37 12	2619	61 58 43	2632	60 20 32	2647	58 42 41	2664
	α Pegasi	E.	79 47 42	2792	78 11 31	2731	76 35 32	2740	74 59 45	2751
18	Spica	W.	83 35 24	2403	85 18 54	2409	87 2 16	2415	88 45 29	2422
	Mars	W.	60 39 43	2598	62 18 41	2604	63 57 31	2609	65 36 14	2614
	Jupiter	W.	48 18 55	2411	50 2 14	2416	51 45 26	2421	53 28 31	2426
	Antares	W.	38 2 12	2498	39 43 28	2494	41 24 49	2492	43 6 13	2492
	Fomalhaut	E.	50 39 35	2769	49 4 27	2797	47 29 55	2827	45 56 2	2860
	α Pegasi	E.	67 5 1	2824	65 31 4	2843	63 57 32	2863	62 24 26	2884
19	Spica	W.	97 19 15	2457	99 1 29	2465	100 43 32	2473	102 25 23	2482
	Mars	W.	73 47 45	2649	75 25 34	2656	77 3 13	2663	78 40 42	2672
	Jupiter	W.	62 1 46	2459	63 43 57	2467	65 25 57	2475	67 7 45	2483
	Antares	W.	51 33 0	2502	53 14 11	2506	54 55 16	2510	56 36 15	2516
	Fomalhaut	E.	38 18 53	3090	36 50 31	3154	35 23 27	3226	33 57 49	3307
	α Pegasi	E.	54 46 36	3023	53 16 52	3059	51 47 52	3097	50 19 39	3139
	α Arietis	E.	96 23 22	2577	94 43 55	2584	93 4 38	2591	91 25 31	2599
20	Mars	W.	86 45 10	2718	88 21 26	2728	89 57 29	2738	91 33 18	2749
	Jupiter	W.	75 33 52	2527	77 14 28	2536	78 54 51	2546	80 35 0	2556
	Antares	W.	64 59 4	2550	66 39 8	2558	68 19 1	2566	69 58 43	2574
	α Pegasi	E.	43 12 42	3415	41 50 42	3488	40 30 5	3569	39 10 57	3659
	α Arietis	E.	83 12 51	2646	81 34 59	2657	79 57 21	2669	78 19 59	2680
	Aldebaran	E.	114 46 37	2491	113 5 11	2500	111 23 58	2510	109 42 59	2520
21	Jupiter	W.	88 52 13	2610	90 30 55	2621	92 9 22	2632	93 47 33	2643
	Antares	W.	78 14 3	2623	79 52 27	2634	81 30 36	2645	83 8 30	2655
	α Aquilæ	W.	40 27 32	4313	41 34 13	4212	42 42 28	4122	43 52 8	4042
	α Arietis	E.	70 17 18	2747	68 41 41	2763	67 6 24	2779	65 31 28	2795
	Aldebaran	E.	101 21 37	2572	99 42 4	2584	98 2 47	2595	96 23 45	2607
22	Jupiter	W.	101 54 33	2704	103 31 8	2716	105 7 27	2729	106 43 29	2741
	Antares	W.	91 14 16	2713	92 50 38	2725	94 26 44	2738	96 2 34	2750
	α Aquilæ	W.	49 57 18	3767	51 12 55	3728	52 29 12	3695	53 46 4	3666

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^h.	P. L. of Diff.	XVIII^h.	P. L. of Diff.	XXI^h.	P. L. of Diff.
15	Sun	W.	107° 11′ 48″	2604	108° 50′ 37″	2607	110° 29′ 23″	2610	112° 8′ 5″	2612
	Spica	W.	48 48 30	2357	50 33 7	2355	52 17 46	2355	54 2 26	2355
	Mars	W.	27 32 22	2610	29 11 4	2599	30 50 0	2591	32 29 7	2585
	α Aquilæ	E.	53 10 0	3326	51 46 19	3380	50 23 40	3439	49 2 8	3505
	Fomalhaut	E.	83 35 29	2525	81 54 51	2529	80 14 18	2534	78 33 52	2539
16	Sun	W.	120 20 39	2627	121 58 57	2631	123 37 10	2635	125 15 17	2640
	Spica	W.	62 45 36	2359	64 30 10	2362	66 14 40	2364	67 59 6	2367
	Mars	W.	40 46 24	2569	42 26 1	2569	44 5 39	2569	45 45 16	2570
	Jupiter	W.	27 33 12	2385	29 17 8	2384	31 1 6	2383	32 45 5	2383
	α Aquilæ	E.	42 35 10	3959	41 22 50	4085	40 12 34	4224	39 4 31	4384
	Fomalhaut	E.	70 13 46	2574	68 34 16	2585	66 55 0	2595	65 15 58	2607
	α Pegasi	E.	86 14 4	2694	84 37 16	2700	83 0 36	2706	81 24 4	2713
17	Spica	W.	76 40 13	2384	78 24 11	2389	80 8 2	2393	81 51 47	2398
	Mars	W.	54 2 52	2582	55 42 12	2585	57 21 28	2589	59 0 38	2593
	Jupiter	W.	41 24 35	2395	43 8 17	2398	44 51 55	2401	46 35 28	2405
	Antares	W.	31 18 43	2530	32 59 15	2518	34 40 3	2510	36 21 3	2503
	Fomalhaut	E.	57 5 13	2681	55 28 8	2700	53 51 28	2721	52 15 16	2744
	α Pegasi	E.	73 24 13	2763	71 48 57	2777	70 13 59	2792	68 39 20	2807
18	Spica	W.	90 28 33	2428	92 11 28	2434	93 54 14	2441	95 36 50	2449
	Mars	W.	67 14 50	2620	68 53 18	2626	70 31 37	2634	72 9 46	2641
	Jupiter	W.	55 11 28	2433	56 54 16	2439	58 36 55	2445	60 19 25	2452
	Antares	W.	44 47 37	2492	46 29 1	2493	48 10 24	2495	49 51 44	2498
	Fomalhaut	E.	41 22 52	2897	42 50 29	2938	41 18 58	2983	39 48 24	3034
	α Pegasi	E.	60 51 47	2908	59 19 38	2933	57 48 1	2962	56 17 0	2991
19	Spica	W.	104 7 2	2490	105 48 29	2499	107 29 43	2510	109 10 43	2520
	Mars	W.	80 18 0	2681	81 55 6	2689	83 32 0	2699	85 8 41	2708
	Jupiter	W.	68 49 22	2491	70 30 48	2499	72 12 2	2509	73 53 3	2517
	Antares	W.	58 17 6	2522	59 57 49	2527	61 38 24	2535	63 18 49	2542
	Fomalhaut	E.	32 33 46	3400	31 11 30	3508	29 51 15	3633	28 33 16	3778
	α Pegasi	E.	48 52 17	3185	47 25 50	3235	46 0 22	3288	44 35 57	3349
	α Arietis	E.	89 46 34	2607	88 7 49	2617	86 29 17	2626	84 50 57	2636
20	Mars	W.	93 8 53	2760	94 44 14	2771	96 19 20	2782	97 54 11	2794
	Jupiter	W.	82 14 56	2566	83 54 37	2577	85 34 4	2588	87 13 16	2599
	Antares	W.	71 38 13	2584	73 17 30	2593	74 56 34	2603	76 35 25	2612
	α Pegasi	E.	37 53 26	3759	36 37 41	3872	35 23 53	3999	34 12 12	4141
	α Arietis	E.	76 42 52	2692	75 6 2	2705	73 29 29	2719	71 53 14	2733
	Aldebaran	E.	108 2 14	2530	106 21 43	2540	104 41 26	2551	103 1 24	2562
21	Jupiter	W.	95 25 29	2655	97 3 9	2667	98 40 33	2679	100 17 41	2691
	Antares	W.	84 46 10	2666	86 23 35	2678	88 0 44	2689	89 37 38	2701
	α Aquilæ	W.	45 3 6	3972	46 15 13	3912	47 28 21	3856	48 42 25	3809
	α Arietis	E.	63 56 53	2811	62 22 40	2829	60 48 50	2847	59 15 23	2866
	Aldebaran	E.	94 44 59	2618	93 6 29	2629	91 28 14	2641	89 50 15	2653
22	Jupiter	W.	108 19 15	2753	109 54 44	2766	111 29 57	2778	113 4 54	2791
	Antares	W.	97 38 7	2763	99 13 24	2775	100 48 25	2788	102 23 9	2801
	α Aquilæ	W.	55 3 27	3641	56 21 17	3619	57 39 31	3599	58 58 6	3584

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	III^h.	P. L. of Diff.	VI^h.	P. L. of Diff.	IX^h.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
22	α Arietis	E.	57 42 20	2885	56 9 42	2906	54 37 31	2927	53 5 47	2750
	Aldebaran	E.	88 12 32	2665	86 35 5	2677	84 57 54	2689	83 20 59	2701
23	α Aquilæ	W.	60 16 58	3570	61 36 5	3557	62 55 26	3547	64 14 58	3540
	α Arietis	E.	45 34 38	3081	44 6 5	3111	42 38 9	3144	41 10 53	3180
	Aldebaran	E.	75 20 27	2762	73 45 9	2774	72 10 7	2786	70 35 21	2798
24	α Aquilæ	W.	70 54 14	3522	72 14 14	3521	73 34 15	3522	74 54 15	3524
	Fomalhaut	W.	35 53 29	3563	37 12 44	3525	38 32 41	3492	39 53 14	3464
	Aldebaran	E.	62 45 22	2857	61 12 8	2868	59 39 8	2879	58 6 22	2891
25	α Aquilæ	W.	81 33 31	3544	82 53 7	3549	84 12 37	3555	85 32 1	3560
	Fomalhaut	W.	46 42 24	3376	48 5 8	3365	49 28 5	3356	50 51 12	3348
	α Pegasi	W.	35 8 50	4301	36 15 42	4214	37 23 55	4137	38 33 21	4069
	Aldebaran	E.	50 26 1	2942	48 54 36	2952	47 23 23	2962	45 52 22	2970
	Pollux	E.	94 39 2	2977	93 8 21	2986	91 37 51	2995	90 7 32	3004
	Sun	E.	134 51 51	3306	133 27 46	3317	132 3 54	3326	130 40 13	3336
26	Fomalhaut	W.	57 48 37	3324	59 12 21	3321	60 36 8	3319	61 59 57	3318
	α Pegasi	W.	44 34 48	3829	45 49 20	3795	47 4 27	3766	48 20 5	3738
	Aldebaran	E.	38 20 1	3012	36 50 3	3019	35 20 14	3026	33 50 33	3032
	Pollux	E.	82 38 39	3045	81 9 22	3052	79 40 14	3060	78 11 15	3067
	Sun	E.	123 44 25	3379	122 21 44	3386	120 59 12	3393	119 36 48	3400
27	Fomalhaut	W.	68 59 30	3312	70 23 28	3310	71 47 28	3309	73 11 29	3308
	α Pegasi	W.	54 44 44	3633	56 2 43	3617	57 20 59	3602	58 39 31	3587
	Pollux	E.	70 48 15	3094	69 19 58	3099	67 51 47	3104	66 23 42	3108
	Sun	E.	112 46 34	3427	111 24 48	3431	110 3 7	3436	108 41 31	3439
28	Fomalhaut	W.	80 11 52	3301	81 36 2	3300	83 0 13	3299	84 24 26	3296
	α Pegasi	W.	65 15 44	3530	66 35 35	3519	67 55 38	3509	69 15 52	3500
	Pollux	E.	59 4 17	3121	57 36 33	3123	56 8 51	3124	54 41 11	3126
	Saturn	E.	79 55 48	3116	78 27 58	3116	77 0 8	3116	75 32 18	3115
	Sun	E.	101 54 11	3446	100 32 47	3446	99 11 23	3446	97 49 59	3446
29	Fomalhaut	W.	91 26 13	3283	92 50 44	3280	94 15 19	3276	95 39 58	3273
	α Pegasi	W.	75 59 31	3456	77 20 44	3448	78 42 6	3440	80 3 37	3431
	α Arietis	W.	32 30 52	3619	33 49 6	3573	35 8 10	3532	36 27 59	3495
	Pollux	E.	47 23 6	3127	45 55 29	3127	44 27 52	3127	43 0 15	3126
	Saturn	E.	68 12 39	3103	66 44 33	3099	65 16 22	3095	63 48 6	3091
	Sun	E.	91 2 34	3433	89 40 55	3429	88 19 11	3425	86 57 23	3420
30	Fomalhaut	W.	102 44 18	3253	104 9 24	3248	105 34 36	3244	106 59 53	3240
	α Arietis	W.	43 16 30	3345	44 39 49	3320	46 3 37	3297	47 27 52	3275
	Pollux	E.	35 42 4	3127	34 14 27	3129	32 46 52	3130	31 19 19	3133
	Saturn	E.	56 25 9	3059	54 56 9	3052	53 27 0	3043	51 57 41	3034
	Sun	E.	80 6 44	3386	78 44 12	3379	77 21 31	3371	75 58 41	3362
31	α Arietis	W.	54 35 25	3173	56 2 7	3153	57 29 12	3134	58 56 40	3116
	Aldebaran	W.	21 21 20	2952	22 52 33	2939	24 24 2	2927	25 55 47	2914
	Saturn	E.	44 28 15	2986	42 57 45	2974	41 27 0	2963	39 56 1	2951
	Sun	E.	69 1 45	3310	67 37 45	3298	66 13 31	3287	64 49 4	3274

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^{h}.	P. L. of Diff.	XVIII^{h}.	P. L. of Diff.	XXI^{h}.	P. L. of Diff.
22	α Arietis	E.	51° 34′ 31″	2973	50° 3′ 45″	2998	48° 33′ 30″	3024	47° 3′ 47″	3052
	Aldebaran	E.	81 44 20	2713	80 7 57	2725	78 31 51	2738	76 56 1	2750
23	α Aquilæ	W.	65 34 38	3534	66 54 25	3528	68 14 18	3525	69 34 15	3523
	α Arietis	E.	39 44 20	3218	38 18 32	3259	36 53 33	3304	35 29 26	3353
	Aldebaran	E.	69 0 50	2810	67 26 35	2821	65 52 35	2834	64 18 51	2845
24	α Aquilæ	W.	76 14 13	3525	77 34 9	3529	78 54 1	3533	80 13 49	3538
	Fomalhaut	W.	41 14 18	3441	42 35 48	3421	43 57 41	3403	45 19 54	3388
	Aldebaran	E.	56 33 51	2901	55 1 34	2912	53 29 30	2922	51 57 39	2932
25	α Aquilæ	W.	86 51 19	3567	88 10 29	3576	89 29 30	3584	90 48 22	3591
	Fomalhaut	W.	52 14 28	3341	53 37 52	3336	55 1 22	3332	56 24 57	3327
	α Pegasi	W.	39 43 53	4010	40 55 23	3957	42 7 45	3910	43 20 55	3867
	Aldebaran	E.	44 21 32	2979	42 50 53	2988	41 20 25	2997	39 50 8	3005
	Pollux	E.	88 37 24	3013	87 7 27	3022	85 37 41	3030	84 8 5	3038
	Sun	E.	129 16 43	3345	127 53 23	3354	126 30 14	3363	125 7 15	3371
26	Fomalhaut	W.	63 23 48	3315	61 47 42	3334	66 11 37	3313	67 35 33	3313
	α Pegasi	W.	49 36 12	3712	50 52 46	3690	52 9 44	3669	53 27 4	3650
	Aldebaran	E.	32 21 0	3039	30 51 35	3045	29 22 18	3051	27 53 8	3056
	Pollux	E.	76 42 25	3073	75 13 42	3078	73 45 6	3084	72 16 37	3090
	Sun	E.	118 14 32	3407	116 52 23	3413	115 30 21	3418	114 8 25	3423
27	Fomalhaut	W.	74 35 31	3307	75 59 34	3306	77 23 38	3305	78 47 44	3303
	α Pegasi	W.	59 58 19	3575	61 17 21	3563	62 36 36	3551	63 56 4	3540
	Pollux	E.	64 55 42	3111	63 27 46	3114	61 59 53	3117	60 32 4	3119
	Sun	E.	107 19 58	3441	105 58 28	3444	104 37 1	3446	103 15 36	3446
28	Fomalhaut	W.	85 48 42	3294	87 13 0	3292	88 37 21	3289	90 1 45	3286
	α Pegasi	W.	70 36 16	3491	71 56 50	3482	73 17 34	3473	74 38 28	3465
	Pollux	E.	53 13 33	3127	51 45 56	3127	50 18 19	3128	48 50 43	3127
	Saturn	E.	74 4 27	3114	72 36 34	3112	71 8 39	3110	69 40 41	3106
	Sun	E.	96 28 35	3445	95 7 9	3442	93 45 40	3440	92 24 9	3437
29	Fomalhaut	W.	97 4 41	3269	98 29 29	3265	99 54 21	3262	101 19 17	3258
	α Pegasi	W.	81 25 18	3423	82 47 8	3415	84 9 8	3407	85 31 17	3399
	α Arietis	W.	37 48 29	3460	39 9 38	3428	40 31 23	3399	41 53 41	3372
	Pollux	E.	41 32 37	3126	40 4 59	3125	38 37 20	3126	37 9 42	3126
	Saturn	E.	62 19 45	3085	60 51 17	3079	59 22 42	3073	57 54 0	3066
	Sun	E.	85 35 29	3415	84 13 29	3408	82 51 22	3401	81 29 7	3394
30	Fomalhaut	W.	108 25 15	3236	109 50 42	3231	111 16 15	3226	112 41 53	3222
	α Arietis	W.	48 52 33	3253	50 17 40	3232	51 43 11	3212	53 9 6	3192
	Pollux	E.	29 51 50	3138	28 24 27	3146	26 57 13	3155	25 30 10	3168
	Saturn	E.	50 28 11	3026	48 58 30	3016	47 28 37	3006	45 58 32	2997
	Sun	E.	74 35 41	3352	73 12 30	3342	71 49 7	3332	70 25 32	3321
31	α Arietis	W.	60 24 30	3097	61 52 43	3080	63 21 17	3062	64 50 13	3044
	Aldebaran	W.	27 27 48	2901	29 0 5	2889	30 32 38	2876	32 5 27	2863
	Saturn	E.	38 24 47	2939	36 53 18	2927	35 21 33	2914	33 49 32	2901
	Sun	E.	63 24 22	3261	61 59 25	3248	60 34 13	3235	59 8 45	3221

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.	Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Subtracted from Apparent Time.	Diff. for 1 Hour.
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Sat.	1	10 43 59.52	9.065	N. 8 2 24.4	−54.68	15 53.80	64.38	0 19.28	0.789
SUN.	2	10 47 36.95	9.054	7 40 28.2	55.00	15 54.03	64.34	0 38.35	0.800
Mon.	3	10 51 14.12	9.044	7 18 24.5	55.31	15 54.27	64.30	0 57.68	0.810
Tues.	4	10 54 51.05	9.034	6 56 13.6	−55.60	15 54.50	64.26	1 17.25	0.820
Wed.	5	10 58 27.75	9.025	6 33 55.8	55.88	15 54.74	64.23	1 37.05	0.829
Thur.	6	11 2 4.24	9.016	6 11 31.5	56.14	15 54.98	64.20	1 57.06	0.838
Frid.	7	11 5 40.53	9.008	5 49 1.1	−56.39	15 55.23	64.18	2 17.27	0.846
Sat.	8	11 9 16.63	9.001	5 26 24.8	56.63	15 55.48	64.15	2 37.66	0.853
SUN.	9	11 12 52.56	8.994	5 3 43.1	56.85	15 55.73	64.13	2 58.22	0.860
Mon.	10	11 16 28.35	8.988	4 40 56.2	−57.06	15 55.99	64.11	3 18.93	0.866
Tues.	11	11 20 4.00	8.983	4 18 4.5	57.24	15 56.25	64.10	3 39.77	0.871
Wed.	12	11 23 39.53	8.979	3 55 8.3	57.42	15 56.51	64.08	4 0.73	0.875
Thur.	13	11 27 14.97	8.975	3 32 8.1	−57.58	15 56.77	64.07	4 21.79	0.879
Frid.	14	11 30 50.32	8.972	3 9 4.1	57.73	15 57.03	64.06	4 42.94	0.882
Sat.	15	11 34 25.61	8.970	2 45 56.6	57.87	15 57.30	64.06	5 4.15	0.884
SUN.	16	11 38 0.86	8.969	2 22 46.0	−57.99	15 57.57	64.06	5 25.40	0.885
Mon.	17	11 41 36.09	8.968	1 59 32.8	58.10	15 57.84	64.06	5 46.65	0.886
Tues.	18	11 45 11.34	8.969	1 36 17.0	58.20	15 58.11	64.06	6 7.90	0.885
Wed.	19	11 48 46.61	8.971	1 12 59.1	−58.28	15 58.38	64.07	6 29.12	0.883
Thur.	20	11 52 21.94	8.974	0 49 39.4	58.35	15 58.65	64.08	6 50.29	0.880
Frid.	21	11 55 57.35	8.978	0 26 18.3	58.40	15 58.92	64.09	7 11.37	0.876
Sat.	22	11 59 32.86	8.983	N. 0 2 56.0	−58.44	15 59.19	64.11	7 32.36	0.871
SUN.	23	12 3 8.49	8.989	S. 0 20 27.2	58.47	15 59.46	64.13	7 53.22	0.865
Mon.	24	12 6 44.27	8.996	0 43 51.0	58.49	15 59.73	64.15	8 13.93	0.858
Tues.	25	12 10 20.23	9.003	1 7 14.8	−58.49	16 0.00	64.17	8 34.47	0.851
Wed.	26	12 13 56.39	9.012	1 30 38.6	58.48	16 0.27	64.20	8 54.81	0.842
Thur.	27	12 17 32.76	9.021	1 54 1.9	58.45	16 0.54	64.24	9 14.93	0.833
Frid.	28	12 21 9.38	9.032	2 17 24.5	−58.41	16 0.81	64.27	9 34.81	0.822
Sat.	29	12 24 46.26	9.043	2 40 45.9	58.36	16 1.08	64.31	9 54.42	0.811
SUN.	30	12 28 23.42	9.055	3 4 5.9	58.29	16 1.35	64.35	10 13.76	0.799
Mon.	31	12 32 0.88	9.068	S. 3 27 24.0	−58.21	16 1.62	64.39	10 32.80	0.786

NOTE.—The mean time of semidiameter passing may be found by subtracting 0s.18 from the sidereal time. The sign — prefixed to the hourly change of declination indicates that north declinations are decreasing; south declinations, increasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	Diff. for 1 Hour.	THE SUN'S Apparent Declination.	Diff. for 1 Hour.	Equation of Time, to be Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	m s	s	h m s
Sat.	1	10 43 59.56	9.067	N. 8 2 24.1	−54.69	0 19.28	0.789	10 44 18.84
SUN.	2	10 47 37.04	9.056	7 40 27.6	55.01	0 38.35	0.800	10 48 15.39
Mon.	3	10 51 14.26	9.046	7 18 23.6	55.32	0 57.68	0.810	10 52 11.95
Tues.	4	10 54 51.24	9.036	6 56 12.4	−55.61	1 17.26	0.820	10 56 8.50
Wed.	5	10 58 27.99	9.027	6 33 54.3	55.89	1 37.07	0.829	11 0 5.06
Thur.	6	11 2 4.53	9.018	6 11 29.7	56.15	1 57.08	0.838	11 4 1.61
Frid.	7	11 5 40.87	9.010	5 48 59 0	−56.40	2 17.29	0.846	11 7 58.16
Sat.	8	11 9 17.02	9.003	5 26 22.4	56.64	2 37.69	0.853	11 11 54.71
SUN.	9	11 12 53.01	8.996	5 3 40 3	56.86	2 58.26	0.860	11 15 51.27
Mon.	10	11 16 28.85	8.990	4 40 53.0	−57.07	3 18.97	0.866	11 19 47.82
Tues.	11	11 20 4.55	8.985	4 18 1.0	57.26	3 39.82	0.871	11 23 44.37
Wed.	12	11 23 40.13	8.981	3 55 4.5	57.44	4 0.79	0.875	11 27 40.92
Thur.	13	11 27 15.62	8.977	3 32 3.9	−57.60	4 21.85	0.879	11 31 37.47
Frid.	14	11 30 51.02	8.974	3 8 59.5	57.75	4 43.00	0.882	11 35 34.02
Sat.	15	11 34 26.36	8.972	2 45 51.7	57.89	5 4.22	0.884	11 39 30.58
SUN.	16	11 38 1.67	8.971	2 22 40.8	−58.01	5 25.47	0.885	11 43 27.13
Mon.	17	11 41 36.95	8.970	1 59 27.2	58.12	5 46.73	0.886	11 47 23.69
Tues.	18	11 45 12.25	8.971	1 36 11.1	58.22	6 7.99	0.885	11 51 20.24
Wed.	19	11 48 47.58	8.973	1 12 52.8	−58.30	6 29.21	0.883	11 55 16.79
Thur.	20	11 52 22.96	8.976	0 49 32.8	58.37	6 50.38	0.880	11 59 13.34
Frid.	21	11 55 58.42	8.980	0 26 11.3	58.42	7 11.47	0.876	12 3 9.89
Sat.	22	11 59 33.98	8.985	N. 0 2 48.6	−58.46	7 32.46	0.871	12 7 6.44
SUN.	23	12 3 9.67	8.991	S. 0 20 34.9	58.49	7 53.33	0.865	12 11 3.00
Mon.	24	12 6 45.51	8.998	0 43 59.0	58.51	8 14.01	0.858	12 14 59.55
Tues.	25	12 10 21.52	9.005	1 7 23.2	−58.51	8 34.59	0.851	12 18 56.11
Wed.	26	12 13 57.73	9.014	1 30 47.3	58.50	8 54.93	0.842	12 22 52.66
Thur.	27	12 17 34.16	9.023	1 54 11.0	58.47	9 15.05	0.833	12 26 49.21
Frid.	28	12 21 10.83	9.034	2 17 33.9	−58.43	9 34.93	0.822	12 30 45.76
Sat.	29	12 24 47.76	9.045	2 40 55.6	58.38	9 54.55	0.811	12 34 42.31
SUN.	30	12 28 24.97	9.057	3 4 15.9	58.31	10 13.89	0.799	12 38 38.86
Mon.	31	12 32 2.48	9.070	S. 3 27 34.3	−58.22	10 32.93	0.786	12 42 35.42

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign − prefixed to the hourly change of declination indicates that north declinations are decreasing; south declinations, increasing.

Diff. for 1 hour, +9ˢ.8565. (Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S TRUE LONGITUDE. λ	THE SUN'S TRUE LONGITUDE. λ'	Diff. for 1 Hour.	THE SUN'S LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
								h m s
1	245	159° 25′ 51.″2	25′ 32.″2	145.″35	− 0.″18	0.0037192	−43.2	13 13 30.80
2	246	160 24 0.6	23 41.5	145.43	− 0.05	0.0036148	43.8	13 9 34.89
3	247	161 22 11.8	21 52.6	145.51	+ 0.09	0.0035088	44.5	13 5 38.98
4	248	162 20 24.9	20 5.6	145.59	+ 0.22	0.0034012	−45.2	13 1 43.08
5	249	163 18 39.9	18 20.5	145.66	0.34	0.0032919	45.9	12 57 47.17
6	250	164 16 56.7	16 37.2	145.74	0.42	0.0031810	46.5	12 53 51.26
7	251	165 15 15.3	14 55.7	145.81	+ 0.49	0.0030685	−47.2	12 49 55.35
8	252	166 13 35.6	13 15.9	145.88	0.52	0.0029545	47.8	12 45 59.45
9	253	167 11 57.6	11 37.8	145.95	0.54	0.0028391	48.4	12 42 3.54
10	254	168 10 21.2	10 1.3	146.02	+ 0.51	0.0027224	−48.9	12 38 7.63
11	255	169 8 46.5	8 26.5	146.09	0.46	0.0026046	49.4	12 34 11.73
12	256	170 7 13.4	6 53.4	146.16	0.38	0.0024857	49.8	12 30 15.83
13	257	171 5 41.9	5 21.9	146.22	+ 0.28	0.0023658	−50.1	12 26 19.92
14	258	172 4 11.9	3 51.8	146.29	0.16	0.0022451	50.4	12 22 24.01
15	259	173 2 43.6	2 23.3	146.35	+ 0.04	0.0021238	50.6	12 18 28.10
16	260	174 1 17.0	0 56.6	146.42	− 0.09	0.0020023	−50.7	12 14 32.20
17	261	174 59 52.1	59 31.6	146.50	0.22	0.0018805	50.8	12 10 36.29
18	262	175 58 29.0	58 8.4	146.57	0.34	0.0017584	50.8	12 6 40.38
19	263	176 57 7.7	56 47.0	146.65	− 0.44	0.0016364	−50.8	12 2 44.48
20	264	177 55 48.2	55 27.4	146.73	0.52	0.0015145	50.8	11 58 48.58
21	265	178 54 30.7	54 9.8	146.81	0.57	0.0013926	50.8	11 54 52.67
22	266	179 53 15 2	52 54.3	146.90	− 0.59	0.0012708	−50.8	11 50 56.76
23	267	180 52 1.9	51 40.9	146.99	0.58	0.0011491	50.7	11 47 0.85
24	268	181 50 50.7	50 29.6	147.08	0.54	0.0010275	50.7	11 43 4.95
25	269	182 49 41.7	49 20.5	147.17	− 0.48	0.0009059	−50.7	11 39 9.04
26	270	183 48 34.9	48 13.6	147.26	0.38	0.0007844	50.7	11 35 13.13
27	271	184 47 30.4	47 9.0	147.36	0.27	0.0006628	50.7	11 31 17.23
28	272	185 46 28.3	46 6.8	147.46	− 0.14	0.0005410	−50.9	11 27 21.33
29	273	186 45 28.6	45 7.0	147.56	0.00	0.0004188	51.0	11 23 25.42
30	274	187 44 31.2	44 9.5	147.66	+ 0.14	0.0002962	51.2	11 19 29.51
31	275	188 43 36.0	43 14.2	147.75	+ 0.27	0.0001732	−51.4	11 15 33.60

NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ', to the mean equinox of January $0^d.0$.

Diff. for 1 Hour, $-9^s.8296$. (Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	15 9.8	15 15.2	55 32.3	+1.56	55 51.9	+1.70	20 49.5	2.18	24.7
2	15 20.9	15 26.9	56 13.0	1.80	56 35.1	1.87	21 42.0	2.20	25.7
3	15 33.1	15 39.4	56 57.8	1.91	57 20.8	1.91	22 34.8	2.19	26.7
4	15 45.6	15 51.6	57 43.5	+1.87	58 5.5	+1.79	23 27.2	2.17	27.7
5	15 57.2	16 2.5	58 26.4	1.68	58 45.7	1.53	6		28.7
6	16 7.2	16 11.3	59 3.0	1.35	59 18.0	1.14	0 19.1	2.15	0.3
7	16 14.6	16 17.3	59 30.3	+0.91	59 39.9	+0.68	1 10.7	2.15	1.3
8	16 19.1	16 20.2	59 46.7	+0.45	59 50 6	+0.21	2 2.4	2.17	2.3
9	16 20.5	16 20.1	59 51.7	−0.02	59 50.2	−0.22	2 54.8	2.21	3.3
10	16 19.0	16 17.4	59 46.4	−0.40	59 40.5	−0.57	3 48.5	2.27	4.3
11	16 15.3	16 12.7	59 32.7	0.71	59 23.3	0.83	4 43.7	2.34	5.3
12	16 9.9	16 6.7	59 12.7	0.93	59 1.0	1.01	5 40.5	2.39	6.3
13	16 3.3	15 59.7	58 48.5	−1.07	58 35.4	−1.11	6 38.1	2.41	7.3
14	15 56.0	15 52.2	58 21 8	1.15	58 7.8	1.18	7 35.5	2.37	8.3
15	15 48.3	15 44.3	57 53.5	1.20	57 39.0	1.22	8 31.5	2.29	9.3
16	15 40.3	15 36.3	57 24.3	−1.23	57 9.4	−1.24	9 25.2	2.18	10.3
17	15 32.2	15 28.1	56 54.5	1.25	56 39.5	1.25	10 16.1	2.06	11.3
18	15 24.1	15 20.0	56 24 6	1.24	56 9.7	1.24	11 4.3	1.95	12.3
19	15 16.0	15 12.1	55 54.9	-1.22	55 40 5	−1.18	11 50.1	1.87	13.3
20	15 8.3	15 4.6	55 26.5	1.14	55 13.0	1.09	12 34.2	1.81	14.3
21	15 1.1	14 57.9	55 0.3	1.02	54 48.5	0.94	13 17.3	1.78	15.3
22	14 55.0	14 52.5	54 37.8	−0.84	54 28.4	−0.73	14 0.1	1.79	16.3
23	14 50.3	14 48.6	54 20.4	0.60	51 14.1	0.45	14 43.2	1.81	17.3
24	14 47.4	14 46.7	54 9.7	−0.28	54 7.3	−0.11	15 27.3	1.86	18.3
25	14 46.7	14 47.2	54 7.1	+0.08	54 9.1	+0.27	16 12.8	1.93	19.3
26	14 48.4	14 50.3	54 13.5	0.48	54 20.5	0.69	16 59.8	2.00	20.3
27	14 52.9	14 56.2	54 30.0	0.90	54 42.0	1.11	17 48.6	2.07	21.3
28	15 0.1	15 4.7	54 56.5	+1.31	55 13.5	+1.51	18 38.8	2.12	22.3
29	15 10.0	15 15.8	55 32.7	1.70	55 51.2	1.87	19 30.1	2.15	23.3
30	15 22.2	15 28.9	56 17.5	2.01	56 42.4	2.13	20 21.8	2.16	24.3
31	15 36.0	15 43.3	57 8.5	+2.21	57 35.3	+2.25	21 13.8	2.16	25.3

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY 1.			
	h m s	s	° ′ ″	″
0	6 50 22.21	2.2267	N.21 19 15.0	− 0.030
1	6 52 35.88	2.2290	21 19 9.9	0.140
2	6 54 49.69	2.2312	21 18 58.2	0.251
3	6 57 3.63	2.2333	21 18 39.8	0.362
4	6 59 17.69	2.2354	21 18 14.8	0.473
5	7 1 31.88	2.2376	21 17 43.1	0.584
6	7 3 46.20	2.2397	21 17 4.7	0.696
7	7 6 0.64	2.2416	21 16 19.6	0.808
8	7 8 15.19	2.2435	21 15 27.7	0.921
9	7 10 29.86	2.2454	21 14 29.1	1.033
10	7 12 44.64	2.2472	21 13 23.7	1.146
11	7 14 59.53	2.2491	21 12 11.6	1.259
12	7 17 14.53	2.2509	21 10 52.7	1.372
13	7 19 29.64	2.2526	21 9 27.0	1.486
14	7 21 44.85	2.2543	21 7 54.4	1.600
15	7 24 0.16	2.2560	21 6 15.0	1.713
16	7 26 15.57	2.2576	21 4 28.8	1.827
17	7 28 31.07	2.2592	21 2 35.7	1.942
18	7 30 46.67	2.2607	21 0 35.8	2.056
19	7 33 2.36	2.2622	20 58 29.0	2.171
20	7 35 18.13	2.2636	20 56 15.3	2.286
21	7 37 33.99	2.2650	20 53 54.7	2.401
22	7 39 49.93	2.2663	20 51 27.2	2.515
23	7 42 5.95	2.2676	N.20 48 52.9	2.629
	SUNDAY 2.			
0	7 44 22.05	2.2689	N.20 46 11.7	2.744
1	7 46 38.22	2.2701	20 43 23.6	2.859
2	7 48 54.46	2.2713	20 40 28.6	2.975
3	7 51 10.78	2.2725	20 37 26.6	3.091
4	7 53 27.16	2.2735	20 34 17.7	3.206
5	7 55 43.60	2.2745	20 31 1.9	3.321
6	7 58 0.10	2.2755	20 27 39.2	3.436
7	8 0 16.66	2.2764	20 24 9.6	3.551
8	8 2 33.27	2.2773	20 20 33.1	3.667
9	8 4 49.94	2.2781	20 16 49.6	3.782
10	8 7 6.65	2.2789	20 12 59.2	3.897
11	8 9 23.41	2.2797	20 9 2.0	4.012
12	8 11 40.22	2.2805	20 4 57.8	4.127
13	8 13 57.07	2.2812	20 0 46.7	4.242
14	8 16 13.96	2.2818	19 56 28.8	4.356
15	8 18 30.88	2.2823	19 52 4.0	4.471
16	8 20 47.84	2.2829	19 47 32.3	4.585
17	8 23 4.83	2.2834	19 42 53.8	4.699
18	8 25 21.84	2.2838	19 38 8.4	4.813
19	8 27 38.88	2.2843	19 33 16.2	4.928
20	8 29 55.95	2.2847	19 28 17.1	5.042
21	8 32 13.04	2.2850	19 23 11.2	5.155
22	8 34 30.15	2.2852	19 17 58.5	5.268
23	8 36 47.27	2.2855	19 12 39.0	5.381
24	8 39 4.41	2.2857	N.19 7 12.8	5.493

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	MONDAY 3.			
	h m s	s	° ′ ″	″
0	8 39 4.41	2.2857	N.19 7 12.8	5.493
1	8 41 21.56	2.2859	19 1 39.8	5.606
2	8 43 38.72	2.2860	18 56 0.1	5.719
3	8 45 55.88	2.2860	18 50 13.6	5.831
4	8 48 13.04	2.2861	18 44 20.4	5.942
5	8 50 30.21	2.2862	18 38 20.5	6.053
6	8 52 47.38	2.2861	18 32 14.0	6.163
7	8 55 4.54	2.2860	18 26 0.9	6.274
8	8 57 21.70	2.2860	18 19 41.1	6.385
9	8 59 38.86	2.2859	18 13 14.7	6.495
10	9 1 56.01	2.2857	18 6 41.7	6.604
11	9 4 13.15	2.2855	18 0 2.2	6.712
12	9 6 30.27	2.2852	17 53 16.2	6.821
13	9 8 47.38	2.2850	17 46 23.7	6.929
14	9 11 4.47	2.2847	17 39 24.7	7.036
15	9 13 21.54	2.2843	17 32 19.3	7.143
16	9 15 38.59	2.2840	17 25 7.5	7.250
17	9 17 55.62	2.2837	17 17 49.3	7.356
18	9 20 12.63	2.2833	17 10 24.8	7.461
19	9 22 29.61	2.2828	17 2 54.0	7.566
20	9 24 46.56	2.2823	16 55 16.9	7.671
21	9 27 3.49	2.2819	16 47 33.5	7.775
22	9 29 20.39	2.2814	16 39 43.9	7.878
23	9 31 37.26	2.2808	N.16 31 48.2	7.980
	TUESDAY 4.			
0	9 33 54.09	2.2803	N.16 23 46.3	8.082
1	9 36 10.89	2.2797	16 15 38.3	8.183
2	9 38 27.65	2.2790	16 7 24.3	8.283
3	9 40 44.37	2.2783	15 59 4.3	8.383
4	9 43 1.05	2.2777	15 50 38.3	8.483
5	9 45 17.70	2.2771	15 42 6.4	8.582
6	9 47 34.31	2.2764	15 33 28.5	8.680
7	9 49 50.87	2.2757	15 24 44.8	8.777
8	9 52 7.39	2.2750	15 15 55.3	8.873
9	9 54 23.87	2.2743	15 7 0.0	8.969
10	9 56 40.31	2.2736	14 57 59.0	9.063
11	9 58 56.70	2.2728	14 48 52.4	9.157
12	10 1 13.04	2.2719	14 39 40.1	9.251
13	10 3 29.33	2.2711	14 30 22.3	9.343
14	10 5 45.58	2.2704	14 20 59.0	9.434
15	10 8 1.78	2.2696	14 11 30.2	9.526
16	10 10 17.93	2.2688	14 1 55.9	9.617
17	10 12 34.03	2.2680	13 52 16.2	9.706
18	10 14 50.09	2.2672	13 42 31.2	9.793
19	10 17 6.09	2.2663	13 32 41.0	9.880
20	10 19 22.04	2.2654	13 22 45.6	9.967
21	10 21 37.94	2.2646	13 12 45.0	10.053
22	10 23 53.79	2.2638	13 2 39.3	10.138
23	10 26 9.60	2.2631	12 52 28.5	10.222
24	10 28 25.36	2.2622	N.12 42 12.7	10.304

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	WEDNESDAY 5.			
	h m s	s	° ′ ″	″
0	10 28 25.36	2.2622	N. 12 42 12.7	10.304
1	10 30 41.06	2.2613	12 31 52.0	10.385
2	10 32 56.71	2.2604	12 21 26.5	10.466
3	10 35 12.31	2.2596	12 10 56.1	10 547
4	10 37 27.86	2.2587	12 0 20.9	10.626
5	10 39 43.36	2.2579	11 49 41.0	10.703
6	10 41 58.81	2.2571	11 38 56.5	10.779
7	10 44 14.21	2.2562	11 28 7.5	10.854
8	10 46 29.56	2.2554	11 17 14.0	10.929
9	10 48 44.86	2.2546	11 6 16.0	11.003
10	10 51 0.11	2.2538	10 55 13.6	11.077
11	10 53 15.32	2.2531	10 44 6.8	11.148
12	10 55 30.48	2.2523	10 32 55.8	11.218
13	10 57 45.59	2.2515	10 21 40.6	11.287
14	11 0 0.66	2.2507	10 10 21.3	11.356
15	11 2 15.68	2.2500	9 58 57.9	11.423
16	11 4 30.66	2.2492	9 47 30.5	11.489
17	11 6 45.59	2.2485	9 35 59.2	11.553
18	11 9 0.48	2.2478	9 24 24.1	11.617
19	11 11 15.32	2.2471	9 12 45.2	11.679
20	11 13 30.13	2.2465	9 1 2.6	11.741
21	11 15 44.90	2.2458	8 49 16.3	11.801
22	11 17 59.63	2.2452	8 37 26.5	11.860
23	11 20 14.32	2.2446	N. 8 25 33.1	11.918
	THURSDAY 6.			
0	11 22 28.98	2.2440	N. 8 13 36.3	11.975
1	11 24 43.60	2.2434	8 1 36.1	12.030
2	11 26 58.19	2.2428	7 49 32.7	12.084
3	11 29 12.74	2.2423	7 37 26.1	12.137
4	11 31 27.26	2.2418	7 25 16.3	12.188
5	11 33 41.76	2.2414	7 13 3.5	12.238
6	11 35 56.23	2.2409	7 0 47.7	12.288
7	11 38 10.67	2.2404	6 48 29.0	12.336
8	11 40 25.08	2.2400	6 36 7.4	12.382
9	11 42 39.47	2.2397	6 23 43.1	12.427
10	11 44 53.84	2.2393	6 11 16.1	12.472
11	11 47 8.19	2.2390	5 58 46.5	12.515
12	11 49 22.52	2.2387	5 46 14.3	12.557
13	11 51 36.83	2.2384	5 33 39.7	12.597
14	11 53 51.13	2.2382	5 21 2.7	12.636
15	11 56 5.41	2.2379	5 8 23.4	12.673
16	11 58 19.68	2.2378	4 55 41.9	12.709
17	12 0 33.94	2.2377	4 42 58.3	12.743
18	12 2 48.20	2.2376	4 30 12.7	12.777
19	12 5 2.45	2.2374	4 17 25.1	12.810
20	12 7 16.69	2.2373	4 4 35.5	12.842
21	12 9 30.93	2.2373	3 51 44.1	12.871
22	12 11 45.17	2.2374	3 38 51.0	12.898
23	12 13 59.42	2.2375	3 25 56.3	12.925
24	12 16 13.67	2.2376	N. 3 13 0.0	12.951

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	FRIDAY 7.			
	h m s	s	° ′ ″	″
0	12 16 13.67	2.2376	N. 3 13 0.0	12.951
1	12 18 27.93	2.2377	3 0 2.2	12.975
2	12 20 42.19	2.2378	2 47 3.0	12.997
3	12 22 56.46	2.2380	2 34 2.5	13.019
4	12 25 10.75	2.2382	2 21 0.7	13.039
5	12 27 25.05	2.2384	2 7 57.8	13.057
6	12 29 39.36	2.2387	1 54 53.8	13.074
7	12 31 53.69	2.2391	1 41 48.9	13.090
8	12 34 8.05	2.2395	1 28 43.0	13.105
9	12 36 22.43	2.2399	1 15 36.3	13.118
10	12 38 36.84	2.2404	1 2 28.9	13.129
11	12 40 51.28	2.2408	0 49 20.8	13.140
12	12 43 5.74	2.2413	0 36 12.1	13.148
13	12 45 20.24	2.2419	0 23 3.0	13.155
14	12 47 34.77	2.2425	N. 0 9 53.5	13.162
15	12 49 49.34	2.2432	S. 0 3 16.4	13.167
16	12 52 3.95	2.2439	0 16 26.5	13.169
17	12 54 18.60	2.2446	0 29 36.7	13.171
18	12 56 33.30	2.2454	0 42 47.0	13.172
19	12 58 48.05	2.2461	0 55 57.3	13.170
20	13 1 2.84	2.2469	1 9 7.4	13.167
21	13 3 17.68	2.2478	1 22 17.3	13.163
22	13 5 32.58	2.2488	1 35 27.0	13.158
23	13 7 47.54	2.2497	S. 1 48 36.3	13.151
	SATURDAY 8.			
0	13 10 2.55	2.2507	S. 2 1 45.1	13.142
1	13 12 17.62	2.2518	2 14 53.4	13.133
2	13 14 32.76	2.2529	2 28 1.1	13.122
3	13 16 47.97	2.2540	2 41 8.0	13.108
4	13 19 3.24	2.2551	2 54 14.1	13.094
5	13 21 18.58	2.2563	3 7 19.3	13.079
6	13 23 34.00	2.2576	3 20 23.6	13.062
7	13 25 49.49	2.2588	3 33 26.8	13.044
8	13 28 5.06	2.2601	3 46 28.9	13.024
9	13 30 20.70	2.2614	3 59 29.7	13.002
10	13 32 36.43	2.2628	4 12 29.2	12.980
11	13 34 52.24	2.2642	4 25 27.3	12.957
12	13 37 8.14	2.2657	4 38 24.0	12.932
13	13 39 24.13	2.2672	4 51 19.1	12.904
14	13 41 40.21	2.2687	5 4 12.5	12.875
15	13 43 56.38	2.2703	5 17 4.1	12.845
16	13 46 12.65	2.2720	5 29 53.9	12.814
17	13 48 29.02	2.2736	5 42 41.8	12.782
18	13 50 45.48	2.2753	5 55 27.7	12.747
19	13 53 2.05	2.2770	6 8 11.5	12.712
20	13 55 18.72	2.2788	6 20 53.2	12.676
21	13 57 35.50	2.2806	6 33 32.6	12.637
22	13 59 52.39	2.2824	6 46 9.7	12.597
23	14 2 9.39	2.2843	6 58 44.3	12.556
24	14 4 26.50	2.2862	S. 7 11 16.4	12.513

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SUNDAY 9.			
	h m s	s	° ′ ″	″
0	14 4 26.50	2.2862	S. 7 11 16.4	12.513
1	14 6 43.73	2.2881	7 23 45.9	12.470
2	14 9 1.07	2.2900	7 36 12.8	12.425
3	14 11 18.53	2.2920	7 48 36.9	12.377
4	14 13 36.11	2.2940	8 0 58.1	12.329
5	14 15 53.81	2.2961	8 13 16.4	12.280
6	14 18 11.64	2.2982	8 25 31.7	12.229
7	14 20 29.59	2.3003	8 37 43.9	12.177
8	14 22 47.67	2.3024	8 49 52.9	12.122
9	14 25 5.88	2.3046	9 1 58.6	12.067
10	14 27 24.22	2.3068	9 14 1.0	12.012
11	14 29 42.69	2.3090	9 26 0.0	11.954
12	14 32 1.30	2.3112	9 37 55.5	11.895
13	14 34 20.04	2.3135	9 49 47.4	11.834
14	14 36 38.92	2.3158	10 1 35.6	11.772
15	14 38 57.94	2.3182	10 13 20.1	11.709
16	14 41 17.10	2.3205	10 25 0.7	11.644
17	14 43 36.40	2.3228	10 36 37.4	11.579
18	14 45 55.84	2.3252	10 48 10.2	11.512
19	14 48 15.43	2.3276	10 59 38.9	11.443
20	14 50 35.16	2.3300	11 11 3.4	11.373
21	14 52 55.03	2.3324	11 22 23.7	11.302
22	14 55 15.05	2.3349	11 33 39.7	11.231
23	14 57 35.22	2.3374	S. 11 44 51.4	11.157
	MONDAY 10.			
0	14 59 55.54	2.3399	S. 11 55 58.6	11.082
1	15 2 16.01	2.3424	12 7 1.2	11.005
2	15 4 36.63	2.3449	12 17 59.2	10.928
3	15 6 57.40	2.3474	12 28 52.6	10.850
4	15 9 18.32	2.3499	12 39 41.2	10.770
5	15 11 39.39	2.3525	12 50 25.0	10.688
6	15 14 0.62	2.3551	13 1 3.8	10.605
7	15 16 22.00	2.3577	13 11 37.6	10.522
8	15 18 43.54	2.3602	13 22 6.4	10.437
9	15 21 5.23	2.3628	13 32 30.1	10.352
10	15 23 27.08	2.3654	13 42 48.6	10.264
11	15 25 49.08	2.3679	13 53 1.8	10.175
12	15 28 11.23	2.3705	14 3 9.6	10.085
13	15 30 33.54	2.3731	14 13 12.0	9.994
14	15 32 56.00	2.3757	14 23 8.9	9.902
15	15 35 18.62	2.3783	14 33 0.3	9.809
16	15 37 41.40	2.3809	14 42 46.0	9.715
17	15 40 4.33	2.3834	14 52 26.1	9.620
18	15 42 27.41	2.3860	15 2 0.4	9.523
19	15 44 50.65	2.3886	15 11 28.9	9.426
20	15 47 14.04	2.3911	15 20 51.5	9.327
21	15 49 37.58	2.3936	15 30 8.1	9.226
22	15 52 1.27	2.3961	15 39 18.6	9.124
23	15 54 25.11	2.3987	15 48 23.0	9.023
24	15 56 49.11	2.4012	S. 15 57 21.3	8.921

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	TUESDAY 11.			
	h m s	s	° ′ ″	″
0	15 56 49.11	2.4012	S. 15 57 21.3	8.921
1	15 59 13.26	2.4037	16 6 13.5	8.817
2	16 1 37.55	2.4061	16 14 59.4	8.711
3	16 4 1.99	2.4086	16 23 38.9	8.604
4	16 6 26.58	2.4110	16 32 11.9	8.497
5	16 8 51.31	2.4133	16 40 38.5	8.389
6	16 11 16.18	2.4157	16 48 58.6	8.280
7	16 13 41.20	2.4181	16 57 12.1	8.170
8	16 16 6.36	2.4204	17 5 19.0	8.059
9	16 18 31.65	2.4227	17 13 19.2	7.947
10	16 20 57.08	2.4250	17 21 12.6	7.834
11	16 23 22.65	2.4273	17 28 59.3	7.721
12	16 25 48.36	2.4296	17 36 39.1	7.606
13	16 28 14.20	2.4317	17 44 12.0	7.490
14	16 30 40.16	2.4338	17 51 37.9	7.374
15	16 33 6.25	2.4359	17 58 56.8	7.257
16	16 35 32.47	2.4380	18 6 8.7	7.139
17	16 37 58.81	2.4401	18 13 13.5	7.020
18	16 40 25.28	2.4421	18 20 11.1	6.900
19	16 42 51.86	2.4440	18 27 1.5	6.779
20	16 45 18.56	2.4459	18 33 44.6	6.658
21	16 47 45.37	2.4478	18 40 20.5	6.537
22	16 50 12.29	2.4496	18 46 49.0	6.414
23	16 52 39.32	2.4514	S. 18 53 10.1	6.290
	WEDNESDAY 12.			
0	16 55 6.46	2.4532	S. 18 59 23.8	6.166
1	16 57 33.70	2.4548	19 5 30.0	6.041
2	17 0 1.04	2.4564	19 11 28.7	5.916
3	17 2 28.47	2.4580	19 17 19.9	5.790
4	17 4 56.00	2.4596	19 23 3.5	5.663
5	17 7 23.62	2.4610	19 28 39.5	5.536
6	17 9 51.32	2.4623	19 34 7.8	5.408
7	17 12 19.10	2.4637	19 39 28.4	5.279
8	17 14 46.96	2.4650	19 44 41.3	5.150
9	17 17 14.90	2.4663	19 49 46.4	5.020
10	17 19 42.92	2.4676	19 54 43.7	4.890
11	17 22 11.01	2.4687	19 59 33.2	4.760
12	17 24 39.16	2.4697	20 4 14.9	4.629
13	17 27 7.37	2.4707	20 8 48.7	4.497
14	17 29 35.64	2.4716	20 13 14.6	4.365
15	17 32 3.96	2.4725	20 17 32.5	4.232
16	17 34 32.34	2.4733	20 21 42.5	4.100
17	17 37 0.76	2.4740	20 25 44.5	3.967
18	17 39 29.22	2.4747	20 29 38.6	3.834
19	17 41 57.72	2.4753	20 33 24.6	3.699
20	17 44 26.25	2.4758	20 37 2.5	3.565
21	17 46 54.82	2.4763	20 40 32.4	3.431
22	17 49 23.41	2.4767	20 43 54.2	3.296
23	17 51 52.02	2.4770	20 47 7.9	3.162
24	17 54 20.65	2.4772	S. 20 50 13.6	3.027

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

THURSDAY 13.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	17 54 20.65	2.4772	S. 20 50 13.6	3.027
1	17 56 49.29	2.4774	20 53 11.1	2.891
2	17 59 17.94	2.4775	20 56 0.5	2.755
3	18 1 46.59	2.4775	20 58 41.7	2.619
4	18 4 15.24	2.4774	21 1 14.8	2.483
5	18 6 43.88	2.4773	21 3 39.7	2.347
6	18 9 12.52	2.4771	21 5 56.4	2.210
7	18 11 41.14	2.4768	21 8 4.9	2.074
8	18 14 9.74	2.4765	21 10 5.3	1.938
9	18 16 38.32	2.4761	21 11 57.5	1.802
10	18 19 6.87	2.4755	21 13 41.5	1.666
11	18 21 35.38	2.4748	21 15 17.4	1.529
12	18 24 3.85	2.4742	21 16 45.0	1.392
13	18 26 32.28	2.4735	21 18 4.4	1.256
14	18 29 0.67	2.4727	21 19 15.7	1.120
15	18 31 29.01	2.4718	21 20 18.8	0.983
16	18 33 57.29	2.4708	21 21 13.7	0.847
17	18 36 25.51	2.4697	21 22 0.4	0.711
18	18 38 53.66	2.4686	21 22 39.0	0.575
19	18 41 21.74	2.4674	21 23 9.4	0.439
20	18 43 49.75	2.4662	21 23 31.7	0.304
21	18 46 17.68	2.4648	21 23 45.9	0.169
22	18 48 45.52	2.4633	21 23 52.0	− 0.033
23	18 51 13.28	2.4619	S. 21 23 49.9	+ 0.102

FRIDAY 14.

0	18 53 40.95	2.4603	S. 21 23 39.7	0.237
1	18 56 8.52	2.4586	21 23 21.5	0.371
2	18 58 35.98	2.4569	21 22 55.2	0.505
3	19 1 3.34	2.4551	21 22 20.9	0.638
4	19 3 30.59	2.4532	21 21 38.6	0.772
5	19 5 57.72	2.4511	21 20 48.3	0.905
6	19 8 24.72	2.4490	21 19 50.0	1.038
7	19 10 51.60	2.4469	21 18 43.8	1.170
8	19 13 18.35	2.4448	21 17 29.6	1.302
9	19 15 44.98	2.4427	21 16 7.5	1.434
10	19 18 11.47	2.4403	21 14 37.5	1.565
11	19 20 37.81	2.4379	21 12 59.7	1.695
12	19 23 4.01	2.4354	21 11 14.1	1.825
13	19 25 30.06	2.4328	21 9 20.7	1.955
14	19 27 55.95	2.4302	21 7 19.5	2.084
15	19 30 21.68	2.4275	21 5 10.6	2.213
16	19 32 47.25	2.4248	21 2 54.0	2.341
17	19 35 12.66	2.4221	21 0 29.7	2.468
18	19 37 37.90	2.4192	20 57 57.8	2.595
19	19 40 2.96	2.4162	20 55 18.3	2.721
20	19 42 27.84	2.4132	20 52 31.3	2.847
21	19 44 52.55	2.4102	20 49 36.7	2.972
22	19 47 17.07	2.4071	20 46 34.6	3.097
23	19 49 41.40	2.4039	20 43 25.1	3.220
24	19 52 5.51	2.4007	S. 20 40 8.2	3.343

SATURDAY 15.

0	19 52 5.54	2.4007	S. 20 40 8.2	3.343
1	19 54 29.48	2.3974	20 36 43.9	3.466
2	19 56 53.22	2.3941	20 33 12.3	3.587
3	19 59 16.77	2.3907	20 29 33.4	3.708
4	20 1 40.11	2.3872	20 25 47.3	3.828
5	20 4 3.24	2.3837	20 21 54.0	3.947
6	20 6 26.16	2.3802	20 17 53.6	4.066
7	20 8 48.86	2.3766	20 13 46.1	4.184
8	20 11 11.35	2.3730	20 9 31.5	4.302
9	20 13 33.62	2.3693	20 5 9.9	4.418
10	20 15 55.67	2.3656	20 0 41.3	4.533
11	20 18 17.49	2.3618	19 56 5.9	4.648
12	20 20 39.08	2.3579	19 51 23.6	4.762
13	20 23 0.44	2.3541	19 46 34.5	4.875
14	20 25 21.57	2.3502	19 41 38.6	4.987
15	20 27 42.46	2.3462	19 36 36.0	5.098
16	20 30 3.12	2.3422	19 31 26.8	5.209
17	20 32 23.53	2.3382	19 26 10.9	5.319
18	20 34 43.70	2.3341	19 20 48.5	5.427
19	20 37 3.62	2.3300	19 15 19.6	5.535
20	20 39 23.30	2.3260	19 9 44.3	5.643
21	20 41 42.74	2.3219	19 4 2.5	5.749
22	20 44 1.93	2.3177	18 58 14.4	5.853
23	20 46 20.86	2.3134	S. 18 52 20.1	5.957

SUNDAY 16.

0	20 48 39.54	2.3092	S. 18 46 19.6	6.060
1	20 50 57.97	2.3050	18 40 12.9	6.162
2	20 53 16.14	2.3007	18 34 0.1	6.264
3	20 55 34.05	2.2963	18 27 41.2	6.365
4	20 57 51.70	2.2920	18 21 16.3	6.464
5	21 0 9.09	2.2878	18 14 45.5	6.562
6	21 2 26.23	2.2835	18 8 8.8	6.660
7	21 4 43.11	2.2791	18 1 26.3	6.757
8	21 6 59.72	2.2746	17 54 38.0	6.852
9	21 9 16.06	2.2702	17 47 44.1	6.946
10	21 11 32.14	2.2657	17 40 44.5	7.040
11	21 13 47.95	2.2613	17 33 39.3	7.132
12	21 16 3.50	2.2569	17 26 28.6	7.223
13	21 18 18.78	2.2524	17 19 12.5	7.313
14	21 20 33.79	2.2480	17 11 51.0	7.403
15	21 22 48.54	2.2436	17 4 24.1	7.492
16	21 25 3.02	2.2391	16 56 51.9	7.580
17	21 27 17.23	2.2347	16 49 14.5	7.666
18	21 29 31.18	2.2302	16 41 32.0	7.751
19	21 31 44.86	2.2257	16 33 44.4	7.835
20	21 33 58.26	2.2212	16 25 51.8	7.918
21	21 36 11.40	2.2167	16 17 54.2	8.001
22	21 38 24.27	2.2122	16 9 51.7	8.082
23	21 40 36.87	2.2077	16 1 44.4	8.162
24	21 42 49.20	2.2032	S. 15 53 32.3	8.241

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

MONDAY 17.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	21 42 49.20	2.2032	S. 15 53 32.3	8.241
1	21 45 1.26	2.1988	15 45 15.5	8.318
2	21 47 13.06	2.1944	15 36 54.1	8.395
3	21 49 24.59	2.1899	15 28 28.1	8.472
4	21 51 35.85	2.1855	15 19 57.5	8.548
5	21 53 46.85	2.1811	15 11 22.4	8.622
6	21 55 57.58	2.1767	15 2 42.9	8.694
7	21 58 8.05	2.1722	14 53 59.1	8.766
8	22 0 18.25	2.1678	14 45 11.0	8.836
9	22 2 28.19	2.1635	14 36 18.8	8.905
10	22 4 37.87	2.1591	14 27 22.4	8.974
11	22 6 47.29	2.1547	14 18 21.9	9.042
12	22 8 56.44	2.1504	14 9 17.3	9.109
13	22 11 5.33	2.1461	14 0 8.8	9.174
14	22 13 13.97	2.1418	13 50 56.4	9.238
15	22 15 22.35	2.1375	13 41 40.2	9.302
16	22 17 30.47	2.1332	13 32 20.2	9.364
17	22 19 38.34	2.1291	13 22 56.5	9.425
18	22 21 45.96	2.1249	13 13 29.2	9.485
19	22 23 53.33	2.1207	13 3 58.3	9.545
20	22 26 0.44	2.1164	12 54 23.8	9.603
21	22 28 7.30	2.1123	12 44 45.9	9.660
22	22 30 13.92	2.1082	12 35 4.6	9.716
23	22 32 20.29	2.1041	S. 12 25 20.0	9.771

TUESDAY 18

0	22 34 26.41	2.1000	S. 12 15 32.1	9.825
1	22 36 32.29	2.0960	12 5 41.0	9.878
2	22 38 37.93	2.0920	11 55 46.7	9.930
3	22 40 43.33	2.0880	11 45 49.4	9.980
4	22 42 48.49	2.0841	11 35 49.1	10.030
5	22 44 53.42	2.0802	11 25 45.8	10.080
6	22 46 58.11	2.0763	11 15 39.5	10.128
7	22 49 2.57	2.0724	11 5 30.4	10.175
8	22 51 6.80	2.0686	10 55 18.5	10.221
9	22 53 10.80	2.0648	10 45 3.9	10.265
10	22 55 14.57	2.0610	10 34 46.7	10.309
11	22 57 18.12	2.0572	10 24 26.8	10.352
12	22 59 21.44	2.0535	10 14 4.4	10.394
13	23 1 24.54	2.0499	10 3 39.5	10.435
14	23 3 27.43	2.0463	9 53 12.2	10.475
15	23 5 30.10	2.0427	9 42 42.5	10.514
16	23 7 32.56	2.0392	9 32 10.5	10.552
17	23 9 34.80	2.0356	9 21 36.3	10.588
18	23 11 36.83	2.0321	9 10 59.9	10.624
19	23 13 38.66	2.0287	9 0 21.4	10.659
20	23 15 40.28	2.0253	8 49 40.8	10.694
21	23 17 41.70	2.0220	8 38 58.1	10.727
22	23 19 42.92	2.0187	8 28 13.5	10.759
23	23 21 43.94	2.0154	8 17 27.0	10.791
24	23 23 44.76	2.0121	S. 8 6 38.6	10.822

WEDNESDAY 19.

	h m s	s	° ′ ″	″
0	23 23 44.76	2.0121	S. 8 6 38.6	10.822
1	23 25 45.39	2.0089	7 55 48.4	10.851
2	23 27 45.83	2.0057	7 44 56.5	10.878
3	23 29 46.08	2.0026	7 34 3.0	10.905
4	23 31 46.14	1.9995	7 23 7.9	10.932
5	23 33 46.02	1.9965	7 12 11.2	10.958
6	23 35 45.72	1.9935	7 1 13.0	10.983
7	23 37 45.24	1.9905	6 50 13.3	11.007
8	23 39 44.58	1.9876	6 39 12.2	11.029
9	23 41 43.75	1.9847	6 28 9.8	11.051
10	23 43 42.75	1.9819	6 17 6.1	11.072
11	23 45 41.58	1.9791	6 6 1.2	11.092
12	23 47 40.24	1.9763	5 54 55.1	11.111
13	23 49 38.74	1.9736	5 43 47.9	11.129
14	23 51 37.08	1.9710	5 32 39.6	11.147
15	23 53 35.26	1.9684	5 21 30.3	11.163
16	23 55 33.29	1.9658	5 10 20.0	11.179
17	23 57 31.16	1.9632	4 59 8.8	11.194
18	23 59 28.88	1.9607	4 47 56.7	11.208
19	0 1 26.45	1.9583	4 36 43.8	11.221
20	0 3 23.88	1.9560	4 25 30.2	11.233
21	0 5 21.17	1.9537	4 14 15.9	11.244
22	0 7 18.32	1.9513	4 3 0.9	11.255
23	0 9 15.33	1.9490	S. 3 51 45.3	11.264

THURSDAY 20.

0	0 11 12.20	1.9468	S. 3 40 29.2	11.273
1	0 13 8.94	1.9447	3 29 12.6	11.281
2	0 15 5.56	1.9426	3 17 55.5	11.288
3	0 17 2.05	1.9405	3 6 38.0	11.294
4	0 18 58.42	1.9385	2 55 20.2	11.300
5	0 20 54.67	1.9364	2 44 2.0	11.305
6	0 22 50.79	1.9344	2 32 43.6	11.308
7	0 24 46.80	1.9326	2 21 25.0	11.311
8	0 26 42.70	1.9308	2 10 6.2	11.313
9	0 28 38.49	1.9290	1 58 47.4	11.314
10	0 30 34.18	1.9272	1 47 28.5	11.315
11	0 32 29.76	1.9255	1 36 9.6	11.315
12	0 34 25.24	1.9238	1 24 50.7	11.314
13	0 36 20.62	1.9222	1 13 31.9	11.312
14	0 38 15.91	1.9206	1 2 13.2	11.310
15	0 40 11.10	1.9191	0 50 54.7	11.306
16	0 42 6.20	1.9177	0 39 36.5	11.302
17	0 44 1.22	1.9162	0 28 18.5	11.297
18	0 45 56.15	1.9148	0 17 0.8	11.292
19	0 47 51.00	1.9135	S. 0 5 43.5	11.285
20	0 49 45.77	1.9122	N. 0 5 33.4	11.277
21	0 51 40.46	1.9109	0 16 49.8	11.269
22	0 53 35.08	1.9097	0 28 5.7	11.261
23	0 55 29.63	1.9086	0 39 21.1	11.252
24	0 57 24.11	1.9075	N. 0 50 35.9	11.241

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	FRIDAY 21.			
	h m s	s	° ′ ″	″
0	0 57 24.11	1.9075	N. 0 50 35.9	11.241
1	0 59 18.53	1.9064	1 1 50.0	11.230
2	1 1 12.88	1.9053	1 13 3.5	11.219
3	1 3 7.17	1.9044	1 24 16.3	11.207
4	1 5 1.41	1.9035	1 35 28.3	11.193
5	1 6 55.59	1.9026	1 46 39.5	11.179
6	1 8 49.72	1.9017	1 57 49.8	11.164
7	1 10 43.80	1.9009	2 8 59.2	11.149
8	1 12 37.83	1.9002	2 20 7.7	11.133
9	1 14 31.82	1.8995	2 31 15.2	11.116
10	1 16 25.77	1.8988	2 42 21.6	11.099
11	1 18 19.68	1.8982	2 53 27.0	11.081
12	1 20 13.56	1.8976	3 4 31.3	11.062
13	1 22 7.40	1.8971	3 15 34.4	11.042
14	1 24 1.21	1.8967	3 26 36.3	11.022
15	1 25 55.00	1.8962	3 37 37.0	11.001
16	1 27 48.76	1.8958	3 48 36.4	10.979
17	1 29 42.50	1.8955	3 59 34.5	10.957
18	1 31 36.22	1.8952	4 10 31.3	10.935
19	1 33 29.92	1.8949	4 21 26.7	10.911
20	1 35 23.61	1.8947	4 32 20.6	10.886
21	1 37 17.29	1.8946	4 43 13.0	10.861
22	1 39 10.96	1.8944	4 54 3.9	10.835
23	1 41 4.62	1.8943	N. 5 4 53.2	10.809
	SATURDAY 22.			
0	1 42 58.28	1.8943	N. 5 15 41.0	10.782
1	1 44 51.94	1.8943	5 26 27.1	10.754
2	1 46 45.60	1.8943	5 37 11.5	10.726
3	1 48 39.26	1.8944	5 47 54.2	10.697
4	1 50 32.93	1.8946	5 58 35.2	10.667
5	1 52 26.61	1.8948	6 9 14.3	10.637
6	1 54 20.31	1.8951	6 19 51.6	10.606
7	1 56 14.02	1.8953	6 30 27.0	10.574
8	1 58 7.75	1.8956	6 41 0.5	10.542
9	2 0 1.49	1.8959	6 51 32.1	10.509
10	2 1 55.25	1.8963	7 2 1.6	10.475
11	2 3 49.04	1.8967	7 12 29.1	10.442
12	2 5 42.86	1.8972	7 22 54.6	10.408
13	2 7 36.71	1.8977	7 33 18.0	10.372
14	2 9 30.59	1.8982	7 43 39.2	10.335
15	2 11 24.50	1.8988	7 53 58.2	10.298
16	2 13 18.45	1.8995	8 4 15.0	10.261
17	2 15 12.44	1.9002	8 14 29.5	10.223
18	2 17 6.47	1.9009	8 24 41.7	10.184
19	2 19 0.55	1.9017	8 34 51.6	10.146
20	2 20 51.67	1.9024	8 44 59.2	10.107
21	2 22 48.84	1.9032	8 55 4.4	10.066
22	2 24 43.06	1.9041	9 5 7.1	10.024
23	2 26 37.33	1.9050	9 15 7.3	9.982
24	2 28 31.66	1.9060	N. 9 25 5.0	9.940
	SUNDAY 23.			
	h m s	s	° ′ ″	″
0	2 28 31.66	1.9060	N. 9 25 5.0	9.940
1	2 30 26.05	1.9070	9 35 0.1	9.897
2	2 32 20.50	1.9080	9 44 52.6	9.853
3	2 34 15.01	1.9091	9 54 42.5	9.810
4	2 36 9.59	1.9102	10 4 29.8	9.766
5	2 38 4.23	1.9113	10 14 14.4	9.721
6	2 39 58.94	1.9124	10 23 56.3	9.675
7	2 41 53.72	1.9136	10 33 35.4	9.628
8	2 43 48.58	1.9149	10 43 11.7	9.581
9	2 45 43.51	1.9162	10 52 45.1	9.533
10	2 47 38.52	1.9175	11 2 15.7	9.485
11	2 49 33.61	1.9188	11 11 43.3	9.436
12	2 51 28.78	1.9202	11 21 8.0	9.387
13	2 53 24.03	1.9216	11 30 29.7	9.337
14	2 55 19.37	1.9231	11 39 48.4	9.287
15	2 57 14.80	1.9246	11 49 4.1	9.236
16	2 59 10.32	1.9261	11 58 16.7	9.184
17	3 1 5.93	1.9277	12 7 26.1	9.131
18	3 3 1.64	1.9293	12 16 32.4	9.078
19	3 4 57.45	1.9309	12 25 35.5	9.024
20	3 6 53.35	1.9325	12 34 35.3	8.970
21	3 8 49.35	1.9342	12 43 31.9	8.916
22	3 10 45.45	1.9359	12 52 25.2	8.861
23	3 12 41.66	1.9377	N.13 1 15.2	8.805
	MONDAY 24.			
0	3 14 37.97	1.9394	N.13 10 1.8	8.748
1	3 16 34.39	1.9412	13 18 45.0	8.691
2	3 18 30.92	1.9431	13 27 24.8	8.634
3	3 20 27.56	1.9449	13 36 1.1	8.576
4	3 22 24.31	1.9468	13 44 33.9	8.517
5	3 24 21.18	1.9487	13 53 3.2	8.458
6	3 26 18.16	1.9507	14 1 28.9	8.398
7	3 28 15.26	1.9527	14 9 51.0	8.338
8	3 30 12.48	1.9547	14 18 9.4	8.277
9	3 32 9.82	1.9567	14 26 21.2	8.216
10	3 34 7.29	1.9588	14 34 35.3	8.154
11	3 36 4.88	1.9609	14 42 42.6	8.091
12	3 38 2.60	1.9631	14 50 46.2	8.028
13	3 40 0.45	1.9652	14 58 46.0	7.964
14	3 41 58.42	1.9673	15 6 41.9	7.899
15	3 43 56.52	1.9694	15 14 33.9	7.835
16	3 45 54.75	1.9716	15 22 22.1	7.770
17	3 47 53.12	1.9739	15 30 6.3	7.704
18	3 49 51.62	1.9762	15 37 46.5	7.637
19	3 51 50.26	1.9781	15 45 22.7	7.570
20	3 53 49.03	1.9807	15 52 54.9	7.502
21	3 55 47.94	1.9830	16 0 23.0	7.434
22	3 57 46.99	1.9853	16 7 47.0	7.365
23	3 59 46.18	1.9877	16 15 6.8	7.296
24	4 1 45.52	1.9901	N.16 22 22.5	7.227

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	TUESDAY 25.			
	h m s	s	° ′ ″	″
0	4 1 45.52	1.9901	N.16 22 22.5	7.227
1	4 3 45.00	1.9925	16 29 34.0	7.156
2	4 5 44.62	1.9949	16 36 41.2	7.084
3	4 7 44.39	1.9973	16 43 44.1	7.013
4	4 9 44.30	1.9997	16 50 42.8	6.941
5	4 11 44.36	2.0022	16 57 37.1	6.868
6	4 13 44.57	2.0047	17 4 27.0	6.795
7	4 15 44.93	2.0072	17 11 12.5	6.722
8	4 17 45.44	2.0097	17 17 53.6	6.647
9	4 19 46.10	2.0123	17 24 30.2	6.572
10	4 21 46.92	2.0149	17 31 2.3	6.497
11	4 23 47.89	2.0174	17 37 29.8	6.421
12	4 25 49.01	2.0200	17 43 52.8	6.345
13	4 27 50.29	2.0226	17 50 11.2	6.268
14	4 29 51.72	2.0252	17 56 24.9	6.190
15	4 31 53.31	2.0277	18 2 34.0	6.112
16	4 33 55.05	2.0303	18 8 38.4	6.034
17	4 35 56.95	2.0330	18 14 38.1	5.955
18	4 37 59.01	2.0357	18 20 33.0	5.875
19	4 40 1.23	2.0383	18 26 23.1	5.795
20	4 42 3.61	2.0410	18 32 8.4	5.714
21	4 44 6.15	2.0436	18 37 48.8	5.633
22	4 46 8.84	2.0462	18 43 24.4	5.551
23	4 48 11.69	2.0489	N.18 48 55.0	5.469
	WEDNESDAY 26.			
0	4 50 14.70	2.0516	N.18 54 20.7	5.387
1	4 52 17.87	2.0543	18 59 41.4	5.303
2	4 54 21.21	2.0570	19 4 57.1	5.219
3	4 56 24.71	2.0596	19 10 7.7	5.134
4	4 58 28.37	2.0623	19 15 13.2	5.050
5	5 0 32.19	2.0651	19 20 13.7	4.966
6	5 2 36.18	2.0678	19 25 9.1	4.880
7	5 4 40.33	2.0704	19 29 59.3	4.793
8	5 6 44.63	2.0731	19 34 44.2	4.705
9	5 8 49.10	2.0758	19 39 23.9	4.617
10	5 10 53.73	2.0785	19 43 58.3	4.530
11	5 12 58.52	2.0812	19 48 27.5	4.442
12	5 15 3.47	2.0838	19 52 51.4	4.353
13	5 17 8.58	2.0865	19 57 9.9	4.263
14	5 19 13.85	2.0892	20 1 23.0	4.174
15	5 21 19.28	2.0919	20 5 30.8	4.084
16	5 23 24.88	2.0946	20 9 33.1	3.993
17	5 25 30.64	2.0973	20 13 29.9	3.901
18	5 27 36.56	2.1000	20 17 21.2	3.809
19	5 29 42.64	2.1027	20 21 7.0	3.716
20	5 31 48.88	2.1053	20 24 47.2	3.623
21	5 33 55.27	2.1079	20 28 21.8	3.530
22	5 36 1.82	2.1105	20 31 50.8	3.437
23	5 38 8.53	2.1131	20 35 14.2	3.343
24	5 40 15.39	2.1157	N.20 38 32.0	3.249
	THURSDAY 27.			
0	5 40 15.39	2.1157	N.20 38 32.0	3.249
1	5 42 22.41	2.1183	20 41 44.1	3.154
2	5 44 29.59	2.1209	20 44 50.4	3.058
3	5 46 36.92	2.1234	20 47 51.0	2.962
4	5 48 44.40	2.1260	20 50 45.8	2.865
5	5 50 52.04	2.1286	20 53 34.8	2.767
6	5 52 59.83	2.1311	20 56 17.9	2.670
7	5 55 7.77	2.1336	20 58 55.2	2.572
8	5 57 15.86	2.1362	21 1 26.6	2.474
9	5 59 24.11	2.1388	21 3 52.1	2.376
10	6 1 32.51	2.1412	21 6 11.7	2.277
11	6 3 41.05	2.1435	21 8 25.3	2.178
12	6 5 49.73	2.1459	21 10 33.0	2.078
13	6 7 58.56	2.1484	21 12 34.7	1.977
14	6 10 7.54	2.1508	21 14 30.3	1.876
15	6 12 16.66	2.1532	21 16 19.8	1.775
16	6 14 25.92	2.1555	21 18 3.3	1.674
17	6 16 35.32	2.1578	21 19 40.7	1.572
18	6 18 44.86	2.1602	21 21 11.9	1.469
19	6 20 54.54	2.1625	21 22 37.0	1.367
20	6 23 4.36	2.1647	21 23 55.9	1.264
21	6 25 14.31	2.1670	21 25 8.7	1.161
22	6 27 24.40	2.1692	21 26 15.2	1.057
23	6 29 34.62	2.1714	N.21 27 15.5	0.952
	FRIDAY 28.			
0	6 31 44.97	2.1736	N.21 28 9.5	0.847
1	6 33 55.45	2.1757	21 28 57.2	0.742
2	6 36 6.06	2.1779	21 29 38.6	0.637
3	6 38 16.80	2.1800	21 30 13.7	0.532
4	6 40 27.66	2.1820	21 30 42.5	0.427
5	6 42 38.64	2.1841	21 31 5.0	0.322
6	6 44 49.75	2.1862	21 31 21.1	0.215
7	6 47 0.98	2.1882	21 31 30.8	+0.108
8	6 49 12.33	2.1901	21 31 34.0	0.000
9	6 51 23.79	2.1920	21 31 30.8	−0.108
10	6 53 35.37	2.1939	21 31 21.1	0.215
11	6 55 47.06	2.1957	21 31 5.0	0.323
12	6 57 58.86	2.1976	21 30 42.4	0.431
13	7 0 10.77	2.1994	21 30 13.3	0.539
14	7 2 22.79	2.2012	21 29 37.7	9.648
15	7 4 34.92	2.2030	21 28 55.6	0.757
16	7 6 47.15	2.2047	21 28 6.9	0.866
17	7 8 59.49	2.2065	21 27 11.7	0.975
18	7 11 11.93	2.2082	21 26 9.9	1.085
19	7 13 24.47	2.2098	21 25 1.5	1.195
20	7 15 37.10	2.2113	21 23 46.5	1.305
21	7 17 49.83	2.2129	21 22 24.9	1.415
22	7 20 2.65	2.2144	21 20 56.7	1.525
23	7 22 15.56	2.2160	21 19 21.9	1.636
24	7 24 28.57	2.2175	N.21 17 40.4	1.747

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SATURDAY 29.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	7 24 28.57	2.2175	N.21 17 40.4	1.747
1	7 26 41.66	2.2189	21 15 52.3	1.858
2	7 28 54.84	2.2203	21 13 57.5	1.969
3	7 31 8.10	2.2217	21 11 56.0	2.080
4	7 33 21.44	2.2230	21 9 47.9	2.191
5	7 35 34.86	2.2243	21 7 33.1	2.302
6	7 37 48.36	2.2256	21 5 11.6	2.414
7	7 40 1.94	2.2269	21 2 43.4	2.526
8	7 42 15.59	2.2281	21 0 8.5	2.637
9	7 44 29.31	2.2293	20 57 26.9	2.749
10	7 46 43.11	2.2305	20 54 38.6	2.862
11	7 48 56.97	2.2316	20 51 43.5	2.974
12	7 51 10.90	2.2327	20 48 41.7	3.086
13	7 53 24.89	2.2338	20 45 33.2	3.198
14	7 55 38.95	2.2348	20 42 18.0	3.310
15	7 57 53.07	2.2357	20 38 56.0	3.422
16	8 0 7.24	2.2367	20 35 27.3	3.534
17	8 2 21.47	2.2377	20 31 51.9	3.647
18	8 4 35.76	2.2386	20 28 9.7	3.759
19	8 6 50.10	2.2394	20 24 20.8	3.871
20	8 9 4.49	2.2403	20 20 25.2	3.982
21	8 11 18.93	2.2411	20 16 22.9	4.094
22	8 13 33.42	2.2418	20 12 13.9	4.207
23	8 15 47.95	2.2426	N.20 7 58.1	4.319

SUNDAY 30.

0	8 18 2.53	2.2433	N.20 3 35.6	4.431
1	8 20 17.15	2.2440	19 59 6.4	4.542
2	8 22 31.81	2.2447	19 54 30.5	4.654
3	8 24 46.51	2.2453	19 49 47.9	4.766
4	8 27 1.25	2.2459	19 44 58.6	4.877
5	8 29 16.02	2.2464	19 40 2.6	4.989
6	8 31 30.82	2.2469	19 34 59.9	5.100
7	8 33 45.65	2.2474	19 29 50.6	5.211
8	8 36 0.51	2.2480	19 24 34.6	5.322
9	8 38 15.41	2.2485	19 19 11.9	5.433
10	8 40 30.33	2.2489	19 13 42.6	5.543
11	8 42 45.28	2.2493	19 8 6.7	5.653
12	8 45 0.25	2.2497	19 2 24.2	5.763
13	8 47 15.24	2.2500	18 56 35.1	5.873
14	8 49 30.25	2.2504	18 50 39.4	5.983
15	8 51 45.29	2.2507	18 44 37.1	6.092
16	8 54 0.34	2.2510	18 38 28.3	6.202
17	8 56 15.41	2.2512	18 32 12.9	6.311
18	8 58 30.49	2.2514	18 25 51.0	6.419
19	9 0 45.58	2.2517	18 19 22.6	6.527
20	9 3 0.69	2.2519	18 12 47.7	6.635
21	9 5 15.81	2.2521	18 6 6.4	6.742
22	9 7 30.94	2.2522	17 59 18.6	6.850
23	9 9 46.08	2.2524	17 52 24.4	6.957
24	9 12 1.23	2.2525	N.17 45 23.7	7.064

MONDAY, OCTOBER 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	9 12 1.23	2.2525	N.17 45 23.7	7.064

PHASES OF THE MOON.

		d	h	m
●	New Moon . . Sept.	5	16	56.1
☽	First Quarter . . .	12	9	59.9
○	Full Moon	19	17	24.3
☾	Last Quarter	27	20	30.2

		d	h
☾	Perigee . . . . Sept.	8	22.7
☾	Apogee	24	19.1

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	III^h.	P. L. of Diff.	VI^h.	P. L. of Diff.	IX^h.	P. L. of Diff.
1	α Arietis	W.	66° 19′ 31″	3026	67° 49′ 11″	3009	69° 19′ 13″	2992	70° 49′ 36″	2974
	Aldebaran	W.	33 38 33	2849	35 11 57	2835	36 45 39	2821	38 19 39	2807
	Saturn	E.	32 17 15	2888	30 44 41	2874	29 11 49	2861	27 38 40	2846
	Sun	E.	57 43 1	3207	56 17 0	3193	54 50 43	3179	53 24 9	3164
2	α Arietis	W.	78 26 57	2889	79 59 30	2873	81 32 24	2856	83 5 39	2839
	Aldebaran	W.	46 14 25	2733	47 50 21	2718	49 26 37	2703	51 3 13	2687
	Sun	E.	46 6 49	3088	44 38 25	3073	43 9 43	3058	41 40 42	3043
3	α Arietis	W.	90 57 12	2760	92 32 32	2745	94 8 12	2730	95 44 12	2716
	Aldebaran	W.	59 11 28	2610	60 50 10	2593	62 29 14	2978	64 8 39	2963
	Sun	E.	34 10 54	2968	32 40 1	2954	31 8 50	2939	29 37 21	2926
7	Sun	W.	17 46 16	2615	19 24 51	2595	21 3 53	2579	22 43 17	2566
	Mars	E.	55 39 26	2464	53 57 22	2460	52 15 12	2456	50 32 57	2453
	Jupiter	E.	57 8 30	2277	55 21 56	2272	53 35 15	2267	51 48 27	2263
	Antares	E.	66 19 15	2283	64 32 51	2279	62 46 21	2276	60 59 46	2274
8	Sun	W.	31 3 57	2525	32 44 35	2521	34 25 19	2517	36 6 9	2514
	Mars	E.	42 0 59	2450	40 18 35	2451	38 36 13	2455	36 53 56	2459
	Jupiter	E.	42 53 17	2252	41 6 7	2252	39 18 57	2252	37 31 47	2253
	Antares	E.	52 6 20	2272	50 19 40	2275	48 33 4	2279	46 46 33	2283
	α Aquilæ	E.	99 1 43	2799	97 27 14	2792	95 52 36	2786	94 17 50	2782
9	Sun	W.	44 31 3	2509	46 12 4	2509	47 53 5	2510	49 34 4	2512
	Antares	E.	37 56 10	2325	36 10 47	2339	34 25 44	2355	32 41 4	2373
	α Aquilæ	E.	86 23 25	2786	84 48 39	2791	83 13 59	2797	81 39 27	2805
10	Sun	W.	57 58 12	2527	59 38 48	2531	61 19 18	2535	62 59 42	2540
	Spica	W.	24 42 9	2399	26 25 45	2380	28 9 49	2366	29 54 13	2355
	α Aquilæ	E.	73 50 0	2868	72 17 0	2885	70 44 22	2905	69 12 9	2926
11	Sun	W.	71 19 57	2568	72 59 36	2574	74 39 6	2581	76 18 27	2588
	Spica	W.	38 38 52	2335	40 24 1	2335	42 9 10	2336	43 54 17	2338
	α Aquilæ	E.	61 38 40	3066	60 9 49	3101	58 41 41	3141	57 14 21	3183
	Fomalhaut	E.	93 19 41	2475	91 37 53	2481	89 56 13	2487	88 14 42	2494
12	Sun	W.	84 32 50	2624	86 11 12	2632	87 49 24	2640	89 27 25	2647
	Spica	W.	52 38 56	2356	54 23 34	2360	56 8 6	2365	57 52 31	2371
	α Aquilæ	E.	50 11 50	3461	48 50 42	3533	47 30 54	3611	46 12 32	3699
	Fomalhaut	E.	79 49 44	2537	78 9 22	2546	76 29 13	2557	74 49 19	2569
	α Pegasi	E.	95 39 10	2681	94 2 4	2686	92 25 5	2692	90 48 14	2699
13	Sun	W.	97 34 48	2689	99 11 43	2697	100 48 27	2706	102 24 59	2714
	Spica	W.	66 32 29	2402	68 16 1	2408	69 59 24	2415	71 42 37	2423
	Jupiter	W.	28 25 21	2445	30 7 51	2450	31 50 15	2454	33 32 33	2460
	Mars	W.	27 12 0	2684	28 49 1	2681	30 26 6	2680	32 3 12	2681
	Antares	W.	21 40 34	2717	23 16 51	2678	24 54 1	2648	26 31 51	2624
	Fomalhaut	E.	66 34 1	2635	64 55 54	2651	63 18 8	2667	61 40 44	2684
	α Pegasi	E.	82 46 42	2745	81 11 2	2756	79 35 37	2768	78 0 27	2781
14	Sun	W.	110 24 47	2758	112 0 10	2767	113 35 21	2776	115 10 20	2785

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^{h}.	P. L. of Diff.	XVIII^{h}.	P. L. of Diff.	XXI^{h}.	P. L. of Diff.
1	α Arietis	W.	72° 20′ 21″	2957	73° 51′ 28″	2940	75° 22′ 56″	2923	76° 54′ 46″	2906
	Aldebaran	W.	39 53 58	2792	41 28 36	2778	43 3 33	2763	44 38 49	2748
	SATURN	E.	26 5 12	2832	24 31 26	2818	22 57 21	2803	21 22 57	2788
	SUN	E.	51 57 17	3150	50 30 8	3134	49 2 40	3119	47 34 54	3104
2	α Arietis	W.	84 39 16	2823	86 13 14	2807	87 47 33	2792	89 22 12	2775
	Aldebaran	W.	52 40 10	2672	54 17 28	2656	55 55 7	2640	57 33 7	2625
	SUN	E.	40 11 22	3027	38 41 43	3012	37 11 45	2997	35 41 29	2982
3	α Arietis	W.	97 20 31	2701	98 57 9	2688	100 34 5	2675	102 11 19	2661
	Aldebaran	W.	65 48 25	2547	67 28 33	2532	69 9 2	2517	70 49 51	2503
	SUN	E.	28 5 35	2913	26 33 33	2902	25 1 17	2891	23 28 47	2882
7	SUN	W.	24 22 59	2555	26 2 56	2545	27 43 6	2538	29 23 27	2531
	MARS	E.	48 50 37	2450	47 8 14	2449	45 25 49	2449	43 43 24	2449
	JUPITER	E.	50 1 33	2260	48 14 34	2257	46 27 31	2255	44 40 25	2253
	Antares	E.	59 13 8	2272	57 26 27	2271	55 39 45	2270	53 53 2	2271
8	SUN	W.	37 47 3	2511	39 28 1	2510	41 9 1	2509	42 50 2	2509
	MARS	E.	35 11 45	2464	33 29 41	2471	31 47 47	2480	30 6 6	2492
	JUPITER	E.	35 44 39	2256	34 57 34	2258	32 10 33	2262	30 23 37	2267
	Antares	E.	45 0 8	2289	43 13 52	2296	41 27 46	2303	39 41 51	2313
	α Aquilæ	E.	92 42 59	2780	91 8 5	2779	89 33 10	2780	87 58 16	2782
9	SUN	W.	51 15 1	2514	52 55 55	2517	54 36 45	2520	56 17 31	2523
	Antares	E.	30 56 51	2396	29 13 11	2423	27 30 9	2455	25 47 52	2494
	α Aquilæ	E.	80 5 5	2814	78 30 55	2825	76 57 0	2838	75 23 21	2852
10	SUN	W.	64 40 0	2545	66 20 11	2551	68 0 14	2556	69 40 10	2562
	Spica	W.	31 38 56	2348	33 23 42	2342	35 8 41	2338	36 53 45	2336
	α Aquilæ	E.	67 40 23	2950	66 9 7	2974	64 38 22	3002	63 8 12	3033
11	SUN	W.	77 57 39	2595	79 36 41	2601	81 15 34	2609	82 54 17	2616
	Spica	W.	45 39 21	2340	47 24 22	2343	49 9 19	2346	50 54 11	2351
	α Aquilæ	E.	55 47 52	3230	54 22 18	3280	52 57 43	3335	51 34 12	3395
	Fomalhaut	E.	86 33 21	2502	84 52 10	2509	83 11 9	2517	81 30 20	2527
12	SUN	W.	91 5 16	2655	92 42 56	2663	94 20 25	2672	95 57 42	2681
	Spica	W.	59 36 48	2377	61 20 56	2382	63 4 56	2389	64 48 47	2395
	α Aquilæ	E.	44 55 44	3795	43 40 37	3902	42 27 19	4019	41 15 58	4150
	Fomalhaut	E.	73 9 41	2580	71 30 19	2593	69 51 14	2607	68 12 28	2621
	α Pegasi	E.	89 11 33	2707	87 35 2	2716	85 58 43	2725	84 22 36	2735
13	SUN	W.	104 1 20	2723	105 37 29	2732	107 13 27	2741	108 49 13	2750
	Spica	W.	73 25 39	2430	75 8 31	2437	76 51 13	2444	78 33 45	2452
	JUPITER	W.	35 14 43	2465	36 56 45	2471	38 38 39	2477	40 20 25	2483
	MARS	W.	33 40 17	2683	35 17 20	2685	36 54 20	2689	38 31 15	2692
	Antares	W.	28 10 13	2607	29 48 50	2593	31 28 3	2583	33 7 21	2576
	Fomalhaut	E.	60 3 43	2703	58 27 7	2722	56 50 57	2744	55 15 15	2766
	α Pegasi	E.	76 25 34	2795	74 50 59	2809	73 16 43	2825	71 42 47	2841
14	SUN	W.	116 45 7	2795	118 19 42	2804	119 54 5	2813	121 28 16	2822

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	III^h.	P. L. of Diff.	VI^h.	P. L. of Diff.	IX^h.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
14	Spica	W.	80 16 6	2460	81 58 16	2467	83 40 16	2475	85 22 5	2482
	Jupiter	W.	42 2 2	2490	43 43 29	2497	45 24 47	2504	47 5 55	2511
	Mars	W.	40 8 5	2697	41 44 49	2702	43 21 26	2708	44 57 55	2714
	Antares	W.	34 46 49	2570	36 26 25	2567	38 6 5	2565	39 45 48	2564
	Fomalhaut	E.	53 40 2	2789	52 5 20	2815	50 31 12	2842	48 57 39	2871
	α Pegasi	E.	70 9 12	2858	68 35 59	2876	67 3 10	2895	65 30 45	2916
15	Sun	W.	123 2 15	2831	124 36 2	2842	126 9 36	2851	127 42 58	2860
	Spica	W.	93 48 22	2522	95 29 4	2531	97 9 34	2540	98 49 52	2548
	Jupiter	W.	55 29 1	2548	57 9 7	2556	58 49 2	2564	60 28 46	2572
	Mars	W.	52 58 19	2747	54 33 57	2754	56 9 25	2761	57 44 44	2769
	Antares	W.	48 4 9	2574	49 43 39	2579	51 23 3	2583	53 2 22	2588
	Fomalhaut	E.	41 20 23	3063	39 51 28	3113	38 23 34	3168	36 56 47	3231
	α Pegasi	E.	57 55 46	3040	56 26 23	3070	54 57 37	3103	53 29 31	3138
	α Arietis	E.	99 49 34	2644	98 11 39	2651	96 33 53	2658	94 56 17	2666
16	Jupiter	W.	68 44 41	2612	70 23 19	2621	72 1 45	2629	73 40 0	2638
	Mars	W.	65 38 47	2808	67 13 4	2816	68 47 11	2825	70 21 7	2832
	Antares	W.	61 17 7	2617	62 55 39	2623	64 34 3	2629	66 12 18	2637
	α Pegasi	E.	46 20 34	3358	44 57 30	3415	43 35 31	3478	42 14 42	3547
	α Arietis	E.	86 50 53	2707	85 14 22	2716	83 38 3	2725	82 1 56	2735
17	Jupiter	W.	81 48 25	2681	83 25 31	2689	85 2 25	2698	86 39 8	2707
	Mars	W.	78 8 4	2876	79 40 54	2885	81 13 32	2894	82 45 59	2903
	Antares	W.	74 21 7	2674	75 58 22	2681	77 35 27	2689	79 12 21	2698
	α Aquilæ	W.	38 0 16	4705	39 1 11	4567	40 4 4	4445	41 8 45	4338
	α Arietis	E.	74 4 41	2787	72 29 56	2799	70 55 27	2811	69 21 13	2823
	Aldebaran	E.	105 17 5	2624	103 38 43	2632	102 0 32	2641	100 22 33	2649
18	Jupiter	W.	94 39 44	2752	96 15 15	2761	97 50 34	2770	99 25 41	2779
	Mars	W.	90 25 19	2949	91 56 36	2958	93 27 41	2969	94 58 33	2978
	Antares	W.	87 14 5	2741	88 49 51	2749	90 25 26	2758	92 0 49	2767
	α Aquilæ	W.	46 53 46	3952	48 6 13	3898	49 19 35	3850	50 33 46	3808
	α Arietis	E.	61 34 16	2892	60 1 47	2908	58 29 38	2924	56 57 50	2941
	Aldebaran	E.	92 15 33	2693	90 38 44	2703	89 2 8	2712	87 25 44	2721
19	Antares	W.	99 54 42	2815	101 28 51	2824	103 2 48	2834	104 36 32	2843
	α Aquilæ	W.	56 54 15	3654	58 11 51	3634	59 29 49	3615	60 48 7	3599
	α Arietis	E.	49 24 29	3039	47 55 5	3062	46 26 9	3087	44 57 44	3114
	Aldebaran	E.	79 26 44	2766	77 51 32	2775	76 16 32	2785	74 41 44	2795
20	α Aquilæ	W.	67 23 16	3547	68 42 48	3541	70 2 27	3537	71 22 10	3534
	Fomalhaut	W.	32 32 21	3703	33 49 5	3643	35 6 53	3593	36 25 35	3549
	Aldebaran	E.	66 50 46	2840	65 17 10	2849	63 43 46	2858	62 10 33	2867
21	α Aquilæ	W.	78 1 19	3532	79 21 8	3535	80 40 54	3537	82 0 37	3542
	Fomalhaut	W.	43 9 7	3407	44 31 16	3389	45 53 45	3373	47 16 32	3359
	α Pegasi	W.	32 16 38	4590	33 19 11	4465	34 23 34	4356	35 29 35	4261
	Aldebaran	E.	54 27 23	2912	52 55 19	2920	51 23 26	2929	49 51 44	2937
	Pollux	E.	98 37 31	2945	97 6 9	2953	95 34 57	2962	94 3 56	2969
22	Fomalhaut	W.	54 13 38	3318	55 37 29	3313	57 1 26	3308	58 25 28	3306

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^h.	P. L. of Diff.	XVIII^h.	P. L. of Diff.	XXI^h.	P. L. of Diff.
14	Spica	W.	87° 3′ 43″	2490	88° 45′ 10″	2499	90° 26′ 25″	2507	92° 7′ 29″	2515
	Jupiter	W.	48 46 53	2518	50 27 41	2526	52 8 18	2533	53 48 45	2541
	Mars	W.	46 34 16	2720	48 10 29	2726	49 46 34	2732	51 22 31	2739
	Antares	W.	41 25 32	2565	43 5 15	2566	44 44 56	2569	46 24 34	2571
	Fomalhaut	E.	47 24 43	2903	45 52 28	2939	44 20 58	2976	42 50 15	3017
	α Pegasi	E.	63 58 47	2939	62 27 17	2961	60 56 15	2985	59 25 44	3012
15	Sun	W.	129 16 8	2870	130 49 5	2880	132 21 49	2891	133 54 20	2900
	Spica	W.	100 29 59	2556	102 9 54	2565	103 49 37	2574	105 29 8	2583
	Jupiter	W.	62 8 19	2580	63 47 41	2588	65 26 52	2596	67 5 52	2604
	Mars	W.	59 19 53	2776	60 54 52	2784	62 29 41	2792	64 4 19	2800
	Antares	W.	54 41 34	2593	56 20 39	2599	57 59 36	2604	59 38 26	2610
	Fomalhaut	E.	35 31 15	3301	34 7 5	3380	32 44 26	3470	31 23 28	3574
	α Pegasi	E.	52 2 7	3175	50 35 28	3215	49 9 37	3259	47 44 38	3306
	α Arietis	E.	93 18 51	2673	91 41 35	2681	90 4 30	2689	88 27 36	2698
16	Jupiter	W.	75 18 4	2646	76 55 57	2655	78 33 38	2663	80 11 7	2672
	Mars	W.	71 54 53	2841	73 28 28	2850	75 1 51	2859	76 35 3	2867
	Antares	W.	67 50 23	2643	69 28 19	2651	71 6 5	2658	72 43 41	2666
	α Pegasi	E.	40 55 10	3623	39 37 0	3706	38 20 19	3798	37 5 15	3903
	α Arietis	E.	80 26 2	2745	78 50 22	2755	77 14 55	2765	75 39 41	2775
17	Jupiter	W.	88 15 39	2716	89 51 58	2725	91 28 5	2734	93 4 0	2742
	Mars	W.	84 18 14	2912	85 50 18	2921	87 22 10	2931	88 53 50	2939
	Antares	W.	80 49 4	2706	82 25 36	2714	84 1 57	2722	85 38 7	2732
	α Aquilæ	W.	42 15 3	4241	43 22 50	4156	44 31 58	4080	45 42 19	4013
	α Arietis	E.	67 47 15	2836	66 13 34	2849	64 40 10	2863	63 7 4	2877
	Aldebaran	E.	98 44 45	2658	97 7 9	2667	95 29 45	2676	93 52 33	2685
18	Jupiter	W.	101 0 36	2788	102 35 19	2798	104 9 49	2808	105 44 7	2818
	Mars	W.	96 29 13	2988	97 59 41	2997	99 29 57	3007	101 0 1	3017
	Antares	W.	93 36 0	2776	95 10 59	2785	96 45 46	2795	98 20 20	2805
	α Aquilæ	W.	51 48 40	3769	53 4 14	3735	54 20 24	3706	55 37 5	3678
	α Arietis	E.	55 26 23	2958	53 55 18	2977	52 24 37	2997	50 54 20	3018
	Aldebaran	E.	85 49 32	2730	84 13 32	2739	82 37 44	2748	81 2 8	2757
19	Antares	W.	106 10 4	2853	107 43 23	2863	109 16 29	2873	110 49 22	2884
	α Aquilæ	W.	62 6 42	3585	63 25 33	3573	64 41 37	3563	66 3 52	3555
	α Arietis	E.	43 29 51	3142	42 2 32	3173	40 35 50	3205	39 9 47	3241
	Aldebaran	E.	73 7 9	2804	71 32 46	2812	69 58 34	2821	68 24 34	2831
20	α Aquilæ	W.	72 41 57	3532	74 1 46	3530	75 21 37	3530	76 41 28	3530
	Fomalhaut	W.	37 45 5	3512	39 5 16	3480	40 26 3	3452	41 47 21	3427
	Aldebaran	E.	60 37 32	2876	59 4 43	2885	57 32 5	2894	55 59 38	2903
21	α Aquilæ	W.	83 20 15	3546	84 39 48	3551	85 59 16	3557	87 18 37	3564
	Fomalhaut	W.	48 39 35	3348	50 2 51	3338	51 26 18	3331	52 49 54	3324
	α Pegasi	W.	36 37 4	4176	37 45 53	4101	38 55 54	4034	40 7 0	3976
	Aldebaran	E.	48 20 12	2946	46 48 51	2954	45 17 40	2962	43 46 39	2970
	Pollux	E.	92 33 5	2977	91 2 24	2985	89 31 53	2993	88 1 32	3001
22	Fomalhaut	W.	59 49 33	3302	61 13 42	3300	62 37 53	3300	64 2 5	3299

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	III^h	P. L. of Diff.	VI^h.	P. L. of Diff.	IX^h.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
22	α Pegasi	W.	41 19 3	3924	42 31 58	3878	43 45 40	3837	45 0 4	3801
	Aldebaran	E.	42 15 49	2978	40 45 9	2985	39 14 38	2993	37 44 16	3000
	Pollux	E.	86 31 20	3009	85 1 18	3017	83 31 26	3024	82 1 43	3030
23	Fomalhaut	W.	65 26 18	3298	66 50 32	3297	68 14 47	3296	69 39 3	3297
	α Pegasi	W.	51 20 20	3667	52 37 42	3648	53 55 25	3630	55 13 27	3613
	Aldebaran	E.	30 14 38	3034	28 45 7	3040	27 15 44	3047	25 46 29	3052
	Pollux	E.	74 35 16	3065	73 6 23	3071	71 37 38	3077	70 9 0	3082
24	Fomalhaut	W.	76 40 15	3299	78 4 28	3299	79 28 41	3300	80 52 53	3300
	α Pegasi	W.	61 47 29	3553	63 6 55	3543	64 26 32	3535	65 46 18	3525
	Pollux	E.	62 47 30	3108	61 19 30	3112	59 51 35	3116	58 23 45	3119
	Saturn	E.	86 47 5	3101	85 18 57	3105	83 50 53	3108	82 22 53	3110
	Regulus	E.	98 28 30	3065	96 59 38	3069	95 30 51	3073	94 2 8	3075
	Sun	E.	131 51 38	3463	130 30 32	3465	129 9 29	3467	127 48 28	3469
25	Fomalhaut	W.	87 53 46	3300	89 17 57	3300	90 42 8	3301	92 6 18	3300
	α Pegasi	W.	72 27 18	3491	73 47 52	3485	75 8 33	3480	76 29 20	3473
	α Arietis	W.	29 8 30	3764	30 24 10	3706	31 40 51	3655	32 58 26	3610
	Pollux	E.	51 5 40	3136	49 38 14	3139	48 10 52	3142	46 43 33	3143
	Saturn	E.	75 3 25	3116	73 35 35	3116	72 7 45	3115	70 39 54	3114
	Regulus	E.	86 39 5	3080	85 10 31	3081	83 41 58	3081	82 13 25	3080
	Sun	E.	121 3 48	3473	119 42 54	3472	118 21 59	3472	117 1 4	3471
26	Fomalhaut	W.	99 7 22	3295	100 31 39	3294	101 55 57	3293	103 20 16	3292
	α Pegasi	W.	83 14 52	3446	84 36 17	3440	85 57 48	3435	87 19 25	3431
	α Arietis	W.	39 37 2	3444	40 58 29	3418	42 20 25	3395	43 42 47	3372
	Pollux	E.	39 27 35	3155	38 0 32	3158	36 33 32	3161	35 6 36	3163
	Saturn	E.	63 20 13	3104	61 52 8	3100	60 23 58	3096	58 55 44	3091
	Regulus	E.	74 50 12	3069	73 21 25	3065	71 52 33	3062	70 23 37	3057
	Sun	E.	110 15 58	3458	108 54 47	3454	107 33 32	3450	106 12 12	3445
27	α Arietis	W.	50 40 36	3276	52 5 15	3259	53 30 14	3242	54 55 33	3226
	Aldebaran	W.	17 19 1	3043	18 48 21	3033	20 17 53	3023	21 47 37	3014
	Saturn	E.	51 32 58	3062	50 4 2	3055	48 34 57	3047	47 5 43	3039
	Regulus	E.	62 57 22	3029	61 27 45	3022	59 57 59	3014	58 28 4	3005
	Sun	E.	99 23 56	3413	98 1 54	3405	96 39 43	3397	95 17 23	3387
28	α Arietis	W.	62 6 56	3146	63 34 10	3129	65 1 44	3114	66 29 37	3098
	Aldebaran	W.	29 19 25	2961	30 50 27	2950	32 21 43	2938	33 53 14	2926
	Saturn	E.	39 36 47	2991	38 6 23	2980	36 35 45	2969	35 4 53	2957
	Regulus	E.	50 55 45	2959	49 24 41	2948	47 53 23	2938	46 21 52	2926
	Sun	E.	88 22 57	3337	86 59 28	3325	85 35 45	3312	84 11 47	3300
29	α Arietis	W.	73 53 54	3018	75 23 45	3001	76 53 57	2984	78 24 30	2968
	Aldebaran	W.	41 34 51	2859	43 8 2	2845	44 41 32	2830	46 15 21	2815
	Regulus	E.	38 40 27	2863	37 7 21	2850	35 33 58	2836	34 0 17	2821
	Sun	E.	77 8 10	3231	75 42 37	3215	74 16 46	3199	72 50 36	3184
30	α Arietis	W.	86 2 27	2883	87 35 7	2866	89 8 9	2849	90 41 33	2833
	Aldebaran	W.	54 9 26	2735	55 45 19	2719	57 21 34	2702	58 58 11	2685
	Sun	E.	65 34 58	3101	64 6 50	3083	62 38 20	3065	61 9 28	3047

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^h.	P. L. of Diff.	XVIII^h.	P. L. of Diff.	XXI^h.	P. L. of Diff.
22	α Pegasi	W.	46° 15′ 5″	3768	47° 30′ 41″	3739	48° 46′ 47″	3712	50° 3′ 21″	3689
	Aldebaran	E.	36 14 3	3007	34 43 59	3014	33 14 4	3021	31 44 17	3027
	Pollux	E.	80 32 8	3038	79 2 42	3045	77 33 25	3052	76 4 16	3059
23	Fomalhaut	W.	71 3 18	3297	72 27 33	3298	73 51 47	3298	75 16 1	3298
	α Pegasi	W.	56 31 47	3599	57 50 22	3587	59 9 11	3574	60 28 14	3563
	Aldebaran	E.	24 17 21	3058	22 48 20	3064	21 19 26	3070	19 50 40	3076
	Pollux	E.	68 40 29	3087	67 12 4	3093	65 43 46	3099	64 15 35	3104
24	Fomalhaut	W.	82 17 4	3301	83 41 14	3301	85 5 24	3300	86 29 35	3300
	α Pegasi	W.	67 6 14	3517	68 26 19	3511	69 46 31	3504	71 6 51	3497
	Pollux	E.	56 55 59	3124	55 28 18	3128	54 0 42	3130	52 33 9	3133
	SATURN	E.	80 54 56	3112	79 27 1	3114	77 59 8	3114	76 31 16	3115
	Regulus	E.	92 33 28	3077	91 4 50	3078	89 36 14	3079	88 7 39	3080
	SUN	E.	126 27 29	3471	125 6 32	3472	123 45 37	3472	122 24 42	3473
25	Fomalhaut	W.	93 30 29	3300	94 54 40	3300	96 18 52	3298	97 43 6	3296
	α Pe asi	W.	77 50 14	3468	79 11 14	3462	80 32 21	3456	81 53 34	3452
	α Arietis	W.	34 16 49	3570	35 35 56	3534	36 55 43	3501	38 16 6	3471
	Pollux	E.	45 16 16	3146	43 49 2	3148	42 21 50	3150	40 54 41	3153
	SATURN	E.	69 12 2	3113	67 44 8	3111	66 16 12	3110	64 48 14	3107
	Regulus	E.	80 44 51	3078	79 16 15	3077	77 47 37	3074	76 18 56	3072
	SUN	E.	115 40 8	3470	114 19 10	3467	112 58 9	3464	111 37 5	3462
26	Fomalhaut	W.	104 44 37	3290	106 9 0	3288	107 33 25	3287	108 57 52	3284
	α Pegasi	W.	88 41 7	3425	90 2 55	3420	91 24 49	3414	92 46 50	3408
	α Arietis	W.	45 5 35	3351	46 28 47	3332	47 52 22	3313	49 16 18	3294
	Pollux	E.	33 39 43	3168	32 12 55	3173	30 46 13	3178	29 19 38	3186
	SATURN	E.	57 27 24	3087	55 58 58	3081	54 30 25	3075	53 1 45	3069
	Regulus	E.	68 54 35	3052	67 25 27	3047	65 56 13	3041	64 26 51	3035
	SUN	E.	104 50 46	3439	103 29 14	3433	102 7 35	3427	100 45 49	3421
27	α Arietis	W.	56 21 11	3210	57 47 8	3193	59 13 25	3178	60 40 1	3162
	Aldebaran	W.	23 17 33	3003	24 47 42	2993	26 18 3	2983	27 48 37	2972
	SATURN	E.	45 36 19	3030	44 6 44	3021	42 36 57	3011	41 6 58	3001
	Regulus	E.	56 57 58	2997	55 27 42	2989	53 57 15	2979	52 26 36	2969
	SUN	E.	93 54 52	3378	92 32 10	3368	91 9 17	3358	89 46 13	3348
28	α Arietis	W.	67 57 49	3082	69 26 21	3066	70 55 12	3050	72 24 23	3034
	Ald baran	W.	35 25 0	2912	36 57 3	2900	38 29 22	2887	40 1 58	2873
	SATURN	E.	33 33 46	2945	32 2 24	2932	30 30 46	2920	28 58 52	2905
	Regulus	E.	44 50 6	2914	43 18 5	2902	41 45 49	2889	40 13 16	2876
	SUN	E.	82 47 35	3287	81 23 8	3273	79 58 25	3259	78 33 26	3245
29	α Arietis	W.	79 55 23	2951	81 26 37	2935	82 58 12	2917	84 30 9	2901
	Aldebaran	W.	47 49 29	2800	49 23 57	2784	50 58 46	2769	52 33 55	2752
	Regulus	E.	32 26 17	2807	30 51 58	2793	29 17 21	2779	27 42 25	2763
	SUN	E.	71 24 8	3168	69 57 21	3152	68 30 14	3134	67 2 46	3118
30	α Arietis	W.	92 15 18	2815	93 49 26	2799	95 23 55	2782	96 58 46	2766
	Aldebaran	W.	60 35 11	2668	62 12 34	2650	63 50 21	2632	65 28 32	2615
	SUN	E.	59 40 14	3030	58 10 38	3012	56 40 40	2993	55 10 19	2975

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.	Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Subtracted from Apparent Time.	Diff. for 1 Hour.
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Mon.	1	12 32 0.88	9.068	S. 3 27 24.0	−58.21	16 1.62	64.39	10 32.80	0.786
Tues.	2	12 35 38.66	9.082	3 50 39.9	58.11	16 1.89	64.43	10 51.52	0.772
Wed.	3	12 39 16.77	9.096	4 13 53.3	58.00	16 2.17	64.48	11 9.91	0.758
Thur.	4	12 42 55.23	9.111	4 37 3.8	−57.87	16 2.44	64.53	11 27.95	0.744
Frid.	5	12 46 34.07	9.126	5 0 10.9	57.72	16 2.72	64.59	11 45.62	0.728
Sat.	6	12 50 13.29	9.142	5 23 14.2	57.56	16 3.00	64.65	12 2.91	0.712
SUN.	7	12 53 52.91	9.159	5 46 13.6	−57.38	16 3.28	64.71	12 19.80	0.695
Mon.	8	12 57 32.94	9.177	6 9 8.4	57.18	16 3.56	64.78	12 36.28	0.677
Tues.	9	13 1 13.40	9.195	6 31 58.2	56.97	16 3.84	64.85	12 52.33	0.659
Wed.	10	13 4 54.31	9.214	6 54 42.8	−56.74	16 4.12	64.91	13 7.92	0.640
Thur.	11	13 8 35.70	9.234	7 17 21.8	56.50	16 4.41	64.98	13 23.04	0.620
Frid.	12	13 12 17.57	9.255	7 39 54.8	56.24	16 4.69	65.06	13 37.68	0.599
Sat.	13	13 15 59.94	9.276	8 2 21.4	−55.96	16 4.97	65.14	13 51.83	0.578
SUN.	14	13 19 42.83	9.298	8 24 41.1	55.67	16 5.25	65.22	14 5.46	0.556
Mon.	15	13 23 26.25	9.321	8 46 53.5	55.36	16 5.54	65.30	14 18.56	0.533
Tues.	16	13 27 10.23	9.345	9 8 58.4	−55.03	16 5.82	65.38	14 31.09	0.509
Wed.	17	13 30 54.80	9.369	9 30 55.4	54.69	16 6.09	65.47	14 43.05	0.485
Thur.	18	13 34 39.96	9.394	9 52 44.0	54.34	16 6.37	65.56	14 54.41	0.460
Frid.	19	13 38 25.75	9.420	10 14 23.9	−53.98	16 6.64	65.65	15 5.15	0.434
Sat.	20	13 42 12.18	9.447	10 35 54.7	53.59	16 6.91	65.75	15 15.25	0.407
SUN.	21	13 45 59.25	9.475	10 57 16.1	53.19	16 7.18	65.85	15 24.70	0.379
Mon.	22	13 49 47.01	9.504	11 18 27.7	−52.77	16 7.45	65.95	15 33.47	0.350
Tues.	23	13 53 35.47	9.534	11 39 29.1	52.34	16 7.71	66.05	15 41.55	0.321
Wed.	24	13 57 24.64	9.564	12 0 19.9	51.89	16 7.97	66.15	15 48.91	0.291
Thur.	25	14 1 14.54	9.594	12 20 59.9	−51.43	16 8.23	66.26	15 55.55	0.260
Frid.	26	14 5 5.19	9.626	12 41 28.5	50.95	16 8.49	66.36	16 1.44	0.229
Sat.	27	14 8 56.60	9.658	13 1 45.4	50.45	16 8.74	66.47	16 6.57	0.197
SUN.	28	14 12 48.78	9.691	13 21 50.2	−49.93	16 8.99	66.58	16 10.93	0.164
Mon.	29	14 16 41.75	9.724	13 41 42.4	49.40	16 9.24	66.69	16 14 50	0.131
Tues.	30	14 20 35.51	9.757	14 1 21.7	48.85	16 9.49	66.80	16 17.28	0.098
Wed.	31	14 24 30.08	9.791	14 20 47.7	48.29	16 9.73	66.91	16 19.26	0.064
Thur.	32	14 28 25.46	9.824	S. 14 39 59.9	−47.71	16 9.98	67.02	16 20.43	0.031

NOTE.—The mean time of semidiameter passing may be found by subtracting 0s.18 from the sidereal time.
The sign − prefixed to the hourly change of declination indicates that south declinations are increasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Equation of Time, to be Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	s	m s	s	h m s
Mon.	1	12 32 2.48	9.070	S. 3 27 34.3	−58.22	10 32.93	0.786	12 42 35.42
Tues.	2	12 35 40.31	9.084	3 50 50.5	58.12	10 51.66	0.772	12 46 31.97
Wed.	3	12 39 18.47	9.098	4 14 4.2	58.01	11 10.05	0.758	12 50 28.52
Thur.	4	12 42 56.98	9.113	4 37 14.9	−57.88	11 28.09	0.744	12 54 25.07
Frid.	5	12 46 35.86	9.128	5 0 22.2	57.73	11 45.76	0.728	12 58 21.63
Sat.	6	12 50 15.13	9.144	5 23 25.8	57.57	12 3.05	0.712	13 2 18.18
SUN.	7	12 53 54.79	9.161	5 46 25.4	−57.39	12 19.94	0.695	13 6 14.73
Mon.	8	12 57 34.86	9.179	6 9 20.4	57.19	12 36.42	0.677	13 10 11.28
Tues.	9	13 1 15.37	9.197	6 32 10.5	56.98	12 52.47	0.659	13 14 7.84
Wed.	10	13 4 56.33	9.216	6 54 55.3	−56.75	13 8.06	0.640	13 18 4.39
Thur.	11	13 8 37.76	9.236	7 17 34.5	56.51	13 23.18	0.620	13 22 0.94
Frid.	12	13 12 19.67	9.257	7 40 7.6	56.25	13 37.82	0.599	13 25 57.49
Sat.	13	13 16 2.08	9.278	8 2 34.3	−55.97	13 51.97	0.578	13 29 54.05
SUN.	14	13 19 45.01	9.300	8 24 54.1	55.68	14 5.60	0.556	13 33 50.60
Mon.	15	13 23 28.47	9.323	8 47 6.7	55.37	14 18.69	0.533	13 37 47.16
Tues.	16	13 27 12.49	9.347	9 9 11.7	−55.04	14 31.22	0.509	13 41 43.71
Wed.	17	13 30 57.09	9.371	9 31 8.8	54.70	14 43.17	0.485	13 45 40.26
Thur.	18	13 34 42.29	9.396	9 52 57.5	54.35	14 54.52	0.460	13 49 36.81
Frid.	19	13 38 28.11	9.422	10 14 37.5	−53.98	15 5.26	0.434	13 53 33.37
Sat.	20	13 42 14.57	9.449	10 36 8.4	53.59	15 15.36	0.407	13 57 29.92
SUN.	21	13 46 1.67	9.477	10 57 29.8	53.19	15 24.80	0.379	14 1 26.47
Mon.	22	13 49 49.46	9.506	11 18 41.4	−52.77	15 33.56	0.350	14 5 23.02
Tues.	23	13 53 37.95	9.535	11 39 42.8	52.34	15 41.63	0.321	14 9 19.58
Wed.	24	13 57 27.14	9.565	12 0 33.6	51.89	15 48.99	0.291	14 13 16.13
Thur.	25	14 1 17.07	9.596	12 21 13.5	−51.43	15 55.62	0.260	14 17 12.69
Frid.	26	14 5 7.75	9.627	12 41 42.1	50.95	16 1.50	0.229	14 21 9.24
Sat.	27	14 8 59.18	9.659	13 1 58.9	50.45	16 6.62	0.197	14 25 5.80
SUN.	28	14 12 51.38	9.692	13 22 3.6	−49.93	16 10.97	0.164	14 29 2.35
Mon.	29	14 16 44.37	9.725	13 41 55.7	49.40	16 14.54	0.131	14 32 58.91
Tues.	30	14 20 38.15	9.758	14 1 34.9	48.85	16 17.31	0.098	14 36 55.46
Wed.	31	14 24 32.73	9.792	14 21 0.8	48.29	16 19.28	0.064	14 40 52.01
Thur.	32	14 28 28.13	9.825	S. 14 40 12.9	−47.71	16 20.44	0.031	14 44 48.56

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign − prefixed to the hourly change of declination indicates that south declinations are increasing.

Diff. for 1 Hour, + 9ˢ.8565. (Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S TRUE LONGITUDE. λ	THE SUN'S TRUE LONGITUDE. λ'	Diff. for 1 Hour.	THE SUN'S LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		° ′ ″	′ ″	″	″			h m s
1	275	188 43 36.0	43 14.2	147.75	+ 0.27	0.0001732	−51.4	11 15 33.60
2	276	189 42 43.1	42 21.2	147.84	0.38	0.0000496	51.6	11 11 37.70
3	277	190 41 52.4	41 30.4	147.93	0.47	9.9999255	51.8	11 7 41.79
4	278	191 41 3.9	40 41.8	148.02	+ 0.54	9.9998008	−52.0	11 3 45.88
5	279	192 40 17.5	39 55.3	148.11	0.58	9.9996755	52.3	10 59 49.98
6	280	193 39 33.2	39 10.9	148.20	0.59	9.9995496	52.5	10 55 54.08
7	281	194 38 50.9	38 28.6	148.28	+ 0.57	9.9994231	−52.8	10 51 58.17
8	282	195 38 10.6	37 48.2	148.36	0.52	9.9992962	53.0	10 48 2.26
9	283	196 37 32.1	37 9.7	148.43	0.44	9.9991690	53.1	10 44 6.35
10	284	197 36 55.4	36 32.9	148.51	+ 0.34	9.9990416	−53.1	10 40 10.45
11	285	198 36 20.5	35 57.9	148.58	0.22	9.9989142	53.1	10 36 14.54
12	286	199 35 47.4	35 24.7	148.66	+ 0.09	9.9987867	53.1	10 32 18.63
13	287	200 35 16.0	34 53.2	148.73	− 0.04	9.9986593	−53.0	10 28 22.72
14	288	201 34 46.4	34 23.5	148.81	0.16	9.9985325	52.7	10 24 26.82
15	289	202 34 18.6	33 55.6	148.88	0.28	9.9984064	52.4	10 20 30.91
16	290	203 33 52.6	33 29.5	148.96	− 0.39	9.9982810	−52.1	10 16 35.00
17	291	204 33 28.3	33 5.1	149.03	0.47	9.9981564	51.7	10 12 39.09
18	292	205 33 5.9	32 42.6	149.11	0.53	9.9980328	51.3	10 8 43.19
19	293	206 32 45.5	32 22.1	149.19	− 0.56	9.9979103	−50.8	10 4 47.28
20	294	207 32 27.0	32 3.5	149.27	0.55	9.9977889	50.3	10 0 51.37
21	295	208 32 10.5	31 46.9	149.36	0.52	9.9976687	49.8	9 56 55.46
22	296	209 31 56.1	31 32.4	149.44	− 0.46	9.9975497	−49.3	9 52 59.56
23	297	210 31 43.7	31 19.9	149.53	0.36	9.9974320	48.8	9 49 3.65
24	298	211 31 33.5	31 9.6	149.62	0.25	9.9973155	48.3	9 45 7.74
25	299	212 31 25.5	31 1.5	149.71	− 0.13	9.9972000	−47.9	9 41 11.83
26	300	213 31 19.8	30 55.7	149.80	0.00	9.9970855	47.5	9 37 15.93
27	301	214 31 16.3	30 52.1	149.90	+ 0.13	9.9969721	47.1	9 33 20.02
28	302	215 31 15.0	30 50.6	149.99	+ 0.26	9.9968596	−46.8	9 29 24.11
29	303	216 31 15.8	30 51.3	150.08	0.38	9.9967478	46.5	9 25 28.20
30	304	217 31 18.8	30 54.2	150.17	0.47	9.9966365	46.2	9 21 32.30
31	305	218 31 23.9	30 59.2	150.26	0.55	9.9965259	46.0	9 17 36.39
32	306	219 31 31.1	31 6.2	150.34	+ 0.60	9.9964159	−45.7	9 13 40.48

NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ', to the mean equinox of January $0^d.0$.

Diff. for 1 Hour, $-9^s.8296$. (Table II.)

GREENWICH MEAN TIME

THE MOON'S

Day of the Month.	SEMIDIAMETER. Noon.	SEMIDIAMETER. Midnight.	HORIZONTAL PARALLAX. Noon.	Diff. for 1 Hour.	HORIZONTAL PARALLAX. Midnight.	Diff. for 1 Hour.	UPPER TRANSIT. Meridian of Greenwich.	Diff. for 1 Hour.	AGE. Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	15 36.0	15 43.3	57 8.5	+2.21	57 35.3	+2.25	21 13.8	2.16	25.3
2	15 50.7	15 58 0	58 2.4	2.25	58 29.2	2.20	22 5.7	2.16	26.3
3	16 5.1	16 11.7	58 55.1	2.09	59 19.4	1.93	22 57.6	2.17	27.3
4	16 17.7	16 23.0	59 41.5	+1.73	60 0.9	+1.48	23 50.0	2.20	28.3
5	16 27.4	16 30.8	60 17.1	1.19	60 29.5	0.87	δ		29.3
6	16 33.1	16 34.3	60 38.0	+0.54	60 42.4	+0.20	0 43.3	2.25	0.9
7	16 34.4	16 33.3	60 42.7	−0.15	60 38.9	−0.47	1 38.1	2.32	1.9
8	16 31.3	16 28.4	60 31.5	0.76	60 20.7	1.02	2 34.7	2.40	2.9
9	16 24.6	16 20.2	60 7.0	1.25	59 50.8	1.43	3 32.9	2.45	3.9
10	16 15.3	16 10.1	59 32.8	−1.56	59 13.5	−1.65	4 32.0	2.46	4.9
11	16 4.5	15 58.9	58 53.2	1.71	58 32.4	1.74	5 30.8	2.42	5.9
12	15 53.2	15 47.6	58 11.5	1.73	57 50.9	1.71	6 27.8	2.32	6.9
13	15 42.1	15 36.7	57 30.6	−1.67	57 10.9	−1.61	7 22.2	2.20	7.9
14	15 31.6	15 26.7	56 52.1	1.54	56 34.1	1.47	8 13.5	2.07	8.9
15	15 22.0	15 17.6	56 16.9	1.39	56 0.7	1.31	9 1.7	1.95	9.9
16	15 13.4	15 9.5	55 45.5	−1.23	55 31.2	−1.16	9 47.5	1.86	10.9
17	15 5.9	15 2.5	55 17.8	1.08	55 5.4	1.00	10 31.5	1.80	11.9
18	14 59.4	14 56.5	54 53.9	0.92	54 43.3	0.84	11 14.4	1.77	12.9
19	14 53.9	14 51.6	54 33.7	−0.76	54 25.1	−0.67	11 56.9	1.77	13.9
20	14 49.5	14 47.8	54 17.6	0.58	54 11.3	0.48	12 39.7	1.80	14.9
21	14 46.4	14 45.4	54 6.2	0.37	54 2.5	−0.25	13 23.4	1.85	15.9
22	14 44.8	14 44.6	54 0.2	−0.12	53 59.6	+0.02	14 8.3	1.90	16.9
23	14 44.9	14 45.7	54 0.7	+0.17	54 3.6	0.33	14 54.7	1.97	17.9
24	14 47.1	14 49.0	54 8.6	0.50	54 15.7	0.68	15 42.6	2.02	18.9
25	14 51.5	14 54.7	54 24.9	+0.87	54 36.5	+1.06	16 31.7	2.07	19.9
26	14 58.4	15 2.9	54 50.4	1.26	55 6.6	1.45	17 21.7	2.09	20.9
27	15 7.9	15 13.6	55 25.2	1.64	55 46.0	1.83	18 12.0	2.10	21.9
28	15 19.8	15 26 6	56 9.0	+2.00	56 34.0	+2.15	19 2.4	2.10	22.9
29	15 33.9	15 41.5	57 0.6	2.27	57 28.5	2.36	19 52.8	2.10	23.9
30	15 49.3	15 57.3	57 57.3	2.42	58 26.6	2.43	20 43.3	2.11	24.9
31	16 5.2	16 12.9	58 55.7	2.39	59 23.9	2.29	21 34.4	2.15	25.9
32	16 20.1	16 26.8	59 50.5	+2.12	60 14.8	+1.90	22 26.8	2.22	26.9

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	MONDAY 1.			
	h m s	s	° ′ ″	″
0	9 12 1.23	2.2525	N.17 45 23.7	7.064
1	9 14 16.38	2.2526	17 38 16.7	7.170
2	9 16 31.54	2.2527	17 31 3.3	7.276
3	9 18 46.70	2.2528	17 23 43.6	7.381
4	9 21 1.87	2.2528	17 16 17.6	7.486
5	9 23 17.04	2.2528	17 8 45.3	7.590
6	9 25 32.21	2.2529	17 1 6.8	7.694
7	9 27 47.39	2.2529	16 53 22.1	7.798
8	9 30 2.56	2.2528	16 45 31.1	7.902
9	9 32 17.73	2.2528	16 37 33.9	8.005
10	9 34 32.90	2.2528	16 29 30.5	8.107
11	9 36 48.07	2.2527	16 21 21.1	8.208
12	9 39 3.23	2.2527	16 13 5.6	8.308
13	9 41 18.39	2.2527	16 4 44.1	8.409
14	9 43 33.55	2.2526	15 56 16.5	8.510
15	9 45 48.70	2.2525	15 47 42.9	8.609
16	9 48 3.85	2.2524	15 39 3.4	8.708
17	9 50 18.99	2.2523	15 30 18.0	8.807
18	9 52 34.13	2.2522	15 21 26.6	8.905
19	9 54 49.26	2.2521	15 12 29.4	9.002
20	9 57 4.38	2.2520	15 3 26.4	9.098
21	9 59 19.50	2.2519	14 54 17.7	9.193
22	10 1 34.61	2.2518	14 45 3.2	9.288
23	10 3 49.72	2.2517	N.14 35 43.1	9.383
	TUESDAY 2.			
0	10 6 4.82	2.2516	N.14 26 17.3	9.477
1	10 8 19.91	2.2514	14 16 45.9	9.570
2	10 10 34.99	2.2513	14 7 8.9	9.662
3	10 12 50.07	2.2512	13 57 26.4	9.753
4	10 15 5.14	2.2511	13 47 38.5	9.844
5	10 17 20.20	2.2510	13 37 45.1	9.935
6	10 19 35.26	2.2509	13 27 46.3	10.024
7	10 21 50.31	2.2508	13 17 42.2	10.113
8	10 24 5.36	2.2507	13 7 32.8	10.201
9	10 26 20.40	2.2506	12 57 18.1	10.287
10	10 28 35.43	2.2505	12 46 58.3	10.373
11	10 30 50.46	2.2505	12 36 33.3	10.459
12	10 33 5.49	2.2504	12 26 3.2	10.543
13	10 35 20.51	2.2503	12 15 28.1	10.627
14	10 37 35.53	2.2502	12 4 48.0	10.709
15	10 39 50.54	2.2502	11 54 3.0	10.791
16	10 42 5.56	2.2502	11 43 13.1	10.872
17	10 44 20.57	2.2502	11 32 18.3	10.953
18	10 46 35.58	2.2502	11 21 18.7	11.032
19	10 48 50.59	2.2502	11 10 14.5	11.109
20	10 51 5.60	2.2503	10 59 5.6	11.186
21	10 53 20.62	2.2503	10 47 52.1	11.262
22	10 55 35.64	2.2503	10 36 34.1	11.337
23	10 57 50.66	2.2503	10 25 11.6	11.412
24	11 0 5.68	2.2504	N.10 13 44.6	11.486
	WEDNESDAY 3.			
	h m s	s	° ′ ″	″
0	11 0 5.68	2.2504	N.10 13 44.6	11.486
1	11 2 20.71	2.2506	10 2 13.3	11.557
2	11 4 35.75	2.2507	9 50 37.7	11.628
3	11 6 50.79	2.2508	9 38 57.9	11.698
4	11 9 5.84	2.2509	9 27 13.9	11.767
5	11 11 20.90	2.2511	9 15 25.8	11.835
6	11 13 35.98	2.2514	9 3 33.7	11.902
7	11 15 51.07	2.2516	8 51 37.6	11.967
8	11 18 6.17	2.2518	8 39 37.6	12.032
9	11 20 21.28	2.2520	8 27 33.7	12.096
10	11 22 36.41	2.2523	8 15 26.1	12.158
11	11 24 51.56	2.2527	8 3 14.7	12.220
12	11 27 6.73	2.2530	7 50 59.7	12.279
13	11 29 21.92	2.2533	7 38 41.2	12.338
14	11 31 37.13	2.2537	7 26 19.2	12.396
15	11 33 52.36	2.2541	7 13 53.7	12.453
16	11 36 7.62	2.2546	7 1 24.9	12.508
17	11 38 22.91	2.2551	6 48 52.8	12.562
18	11 40 38.23	2.2556	6 36 17.5	12.614
19	11 42 53.58	2.2561	6 23 39.1	12.666
20	11 45 8.96	2.2566	6 10 57.6	12.716
21	11 47 24.37	2.2572	5 58 13.2	12.764
22	11 49 39.82	2.2578	5 45 25.9	12.812
23	11 51 55.31	2.2585	N. 5 32 35.8	12.858
	THURSDAY 4.			
0	11 54 10.84	2.2592	N. 5 19 42.9	12.903
1	11 56 26.41	2.2598	5 6 47.4	12.947
2	11 58 42.02	2.2605	4 53 49.3	12.989
3	12 0 57.67	2.2613	4 40 48.7	13.030
4	12 3 13.37	2.2621	4 27 45.7	13.070
5	12 5 29.12	2.2630	4 14 40.3	13.108
6	12 7 44.93	2.2639	4 1 32.7	13.145
7	12 10 0.79	2.2647	3 48 22.9	13.181
8	12 12 16.70	2.2656	3 35 11.0	13.214
9	12 14 32.66	2.2665	3 21 57.2	13.246
10	12 16 48.68	2.2675	3 8 41.5	13.277
11	12 19 4.76	2.2686	2 55 23.9	13.308
12	12 21 20.91	2.2697	2 42 4.5	13.337
13	12 23 37.12	2.2708	2 28 43.5	13.363
14	12 25 53.40	2.2719	2 15 20.9	13.388
15	12 28 9.75	2.2730	2 1 56.9	13.412
16	12 30 26.17	2.2742	1 48 31.5	13.435
17	12 32 42.66	2.2755	1 35 4.7	13.457
18	12 34 59.23	2.2768	1 21 36.7	13.476
19	12 37 15.88	2.2782	1 8 7.6	13.493
20	12 39 32.61	2.2795	0 54 37.5	13.510
21	12 41 49.42	2.2808	0 41 6.4	13.525
22	12 44 6.31	2.2822	0 27 34.5	13.538
23	12 46 23.28	2.2836	0 14 1.9	13.549
24	12 48 40.34	2.2851	N. 0 0 28.6	13.560

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute
	FRIDAY 5.			
	h m s	s	° ′ ″	″
0	12 48 40.34	2.2851	N. 0 0 28.6	13.560
1	12 50 57.49	2.2867	S. 0 13 5.3	13.568
2	12 53 14.74	2.2882	0 26 39.6	13.575
3	12 55 32.08	2.2898	0 40 14.3	13.581
4	12 57 49.52	2.2915	0 53 49.3	13.585
5	13 0 7.06	2.2932	1 7 24.5	13.587
6	13 2 24.70	2.2949	1 20 59.8	13.588
7	13 4 42.45	2.2966	1 34 35.1	13.587
8	13 7 0.30	2.2983	1 48 10.3	13.585
9	13 9 18.25	2.3001	2 1 45.3	13.581
10	13 11 36.31	2.3020	2 15 20.0	13.575
11	13 13 54.49	2.3039	2 28 54.3	13.568
12	13 16 12.78	2.3058	2 42 28.2	13.560
13	13 18 31.19	2.3078	2 56 1.5	13.549
14	13 20 49.72	2.3097	3 9 34.1	13.537
15	13 23 8.36	2.3117	3 23 5.9	13.523
16	13 25 27.13	2.3138	3 36 36.9	13.508
17	13 27 46.02	2.3158	3 50 6.9	13.491
18	13 30 5.03	2.3179	4 3 35.8	13.472
19	13 32 24.17	2.3201	4 17 3.6	13.452
20	13 34 43.45	2.3224	4 30 30.1	13.430
21	13 37 2.86	2.3246	4 43 55.2	13.407
22	13 39 22.40	2.3268	4 57 18.9	13.382
23	13 41 42.08	2.3291	S. 5 10 41.0	13.354
	SATURDAY 6.			
0	13 44 1.89	2.3314	S. 5 24 1.4	13.326
1	13 46 21.84	2.3337	5 37 20.1	13.296
2	13 48 41.93	2.3361	5 50 36.9	13.263
3	13 51 2.17	2.3385	6 3 51.7	13.230
4	13 53 22.55	2.3409	6 17 4.5	13.195
5	13 55 43.08	2.3433	6 30 15.1	13.158
6	13 58 3.75	2.3457	6 43 23.5	13.120
7	14 0 24.57	2.3482	6 56 29.5	13.080
8	14 2 45.54	2.3508	7 9 33.1	13.038
9	14 5 6.67	2.3534	7 22 34.1	12.994
10	14 7 27.95	2.3559	7 35 32.4	12.949
11	14 9 49.38	2.3585	7 48 28.0	12.902
12	14 12 10.97	2.3612	8 1 20.7	12.854
13	14 14 32.72	2.3638	8 14 10.5	12.804
14	14 16 54.63	2.3664	8 26 57.2	12.752
15	14 19 16.69	2.3690	8 39 40.8	12.699
16	14 21 38.91	2.3718	8 52 21.1	12.644
17	14 24 1.30	2.3746	9 4 58.1	12.587
18	14 26 23.86	2.3773	9 17 31.6	12.529
19	14 28 46.58	2.3800	9 30 1.6	12.469
20	14 31 9.46	2.3827	9 42 27.9	12.407
21	14 33 32.50	2.3854	9 54 50.5	12.345
22	14 35 55.71	2.3882	10 7 9.3	12.281
23	14 38 19.09	2.3911	10 19 24.2	12.214
24	14 40 42.64	2.3938	S. 10 31 35.0	12.145

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SUNDAY 7.			
	h m s	s	° ′ ″	″
0	14 40 42.64	2.3938	S. 10 31 35.0	12.145
1	14 43 6.35	2.3966	10 43 41.6	12.076
2	14 45 30.23	2.3995	10 55 44.1	12.006
3	14 47 54.29	2.4024	11 7 42.3	11.933
4	14 50 18.52	2.4052	11 19 36.1	11.859
5	14 52 42.91	2.4079	11 31 25.4	11.783
6	14 55 7.47	2.4107	11 43 10.1	11.706
7	14 57 32.20	2.4136	11 54 50.1	11.627
8	14 59 57.10	2.4165	12 6 25.3	11.547
9	15 2 22.18	2.4194	12 17 55.7	11.465
10	15 4 47.43	2.4222	12 29 21.1	11.382
11	15 7 12.84	2.4249	12 40 41.5	11.298
12	15 9 38.42	2.4277	12 51 56.8	11.212
13	15 12 4.17	2.4306	13 3 6.9	11.123
14	15 14 30.09	2.4334	13 14 11.6	11.033
15	15 16 56.18	2.4362	13 25 10.9	10.943
16	15 19 22.44	2.4390	13 36 4.7	10.851
17	15 21 48.86	2.4417	13 46 53.0	10.757
18	15 24 15.45	2.4445	13 57 35.6	10.662
19	15 26 42.20	2.4472	14 8 12.4	10.566
20	15 29 9.12	2.4500	14 18 43.5	10.469
21	15 31 36.20	2.4527	14 29 8.7	10.370
22	15 34 3.44	2.4554	14 39 27.9	10.269
23	15 36 30.85	2.4581	S. 14 49 41.0	10.167
	MONDAY 8.			
0	15 38 58.42	2.4607	S. 14 59 48.0	10.065
1	15 41 26.14	2.4633	15 9 48.8	9.961
2	15 43 54.02	2.4660	15 19 43.3	9.854
3	15 46 22.06	2.4686	15 29 31.3	9.747
4	15 48 50.25	2.4711	15 39 12.9	9.639
5	15 51 18.59	2.4737	15 48 48.0	9.530
6	15 53 47.09	2.4762	15 58 16.5	9.419
7	15 56 15.73	2.4786	16 7 38.3	9.307
8	15 58 44.52	2.4810	16 16 53.4	9.195
9	16 1 13.45	2.4833	16 26 1.7	9.081
10	16 3 42.52	2.4857	16 35 3.1	8.966
11	16 6 11.73	2.4880	16 43 57.6	8.849
12	16 8 41.08	2.4902	16 52 45.0	8.731
13	16 11 10.56	2.4924	17 1 25.3	8.612
14	16 13 40.17	2.4946	17 9 58.5	8.493
15	16 16 9.91	2.4967	17 18 24.5	8.372
16	16 18 39.78	2.4989	17 26 43.2	8.251
17	16 21 9.78	2.5010	17 34 54.6	8.128
18	16 23 39.90	2.5029	17 42 58.6	8.005
19	16 26 10.13	2.5048	17 50 55.2	7.880
20	16 28 40.48	2.5067	17 58 44.2	7.754
21	16 31 10.94	2.5085	18 6 25.6	7.627
22	16 33 41.50	2.5102	18 13 59.4	7.500
23	16 36 12.17	2.5120	18 21 25.6	7.372
24	16 38 42.94	2.5137	S. 18 28 44.1	7.243

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	TUESDAY 9.			
	h m s	s	° ′ ″	″
0	16 38 42.94	2.5137	S. 18 28 44.1	7.243
1	16 41 13.81	2.5153	18 35 54.8	7.113
2	16 43 44.77	2.5168	18 42 57.6	6.982
3	16 46 15.82	2.5183	18 49 52.6	6.850
4	16 48 46.96	2.5196	18 56 39.6	6.718
5	16 51 18.18	2.5209	19 3 18.7	6.585
6	16 53 49.47	2.5222	19 9 49.8	6.451
7	16 56 20.84	2.5234	19 16 12.8	6.316
8	16 58 52.28	2.5245	19 22 27.7	6.182
9	17 1 23.78	2.5256	19 28 34.6	6.047
10	17 3 55.35	2.5266	19 34 33.3	5.910
11	17 6 26.97	2.5275	19 40 23.8	5.772
12	17 8 58.65	2.5284	19 46 6.0	5.635
13	17 11 30.38	2.5292	19 51 40.0	5.497
14	17 14 2.15	2.5299	19 57 5.7	5.358
15	17 16 33.96	2.5305	20 2 23.0	5.219
16	17 19 5.81	2.5310	20 7 32.0	5.080
17	17 21 37.68	2.5314	20 12 32.6	4.940
18	17 24 9.58	2.5318	20 17 24.8	4.800
19	17 26 41.50	2.5321	20 22 8.6	4.659
20	17 29 13.43	2.5324	20 26 43.9	4.517
21	17 31 45.38	2.5326	20 31 10.7	4.376
22	17 34 17.34	2.5326	20 35 29.0	4.234
23	17 36 49.29	2.5325	S. 20 39 38.8	4.092
	WEDNESDAY 10.			
0	17 39 21.24	2.5324	S. 20 43 40.1	3.950
1	17 41 53.18	2.5322	20 47 32.8	3.807
2	17 44 25.11	2.5320	20 51 17.0	3.665
3	17 46 57.02	2.5317	20 54 52.6	3.522
4	17 49 28.91	2.5312	20 58 19.6	3 379
5	17 52 0.76	2.5306	21 1 38.0	3.236
6	17 54 32.58	2.5300	21 4 47.9	3.093
7	17 57 4.36	2.5293	21 7 49.2	2.949
8	17 59 36.10	2.5286	21 10 41.8	2.805
9	18 2 7.79	2.5277	21 13 25.8	2.662
10	18 4 39.42	2.5267	21 16 1.2	2.518
11	18 7 10.99	2.5257	21 18 28.0	2.375
12	18 9 42.50	2.5246	21 20 46.2	2.232
13	18 12 13.94	2.5233	21 22 55.8	2.088
14	18 14 45.30	2.5220	21 24 56.8	1.944
15	18 17 16.58	2.5206	21 26 49.1	1.801
16	18 19 47.77	2.5191	21 28 32.9	1.658
17	18 22 18.87	2.5175	21 30 8.1	1.515
18	18 24 49.87	2.5158	21 31 34.7	1.372
19	18 27 20.77	2.5141	21 32 52.8	1.230
20	18 29 51.57	2.5124	21 34 2.3	1.087
21	18 32 22.26	2.5105	21 35 3.3	0.945
22	18 34 52.83	2.5085	21 35 55.7	0.803
23	18 37 23.28	2.5064	21 36 39.7	0.662
24	18 39 53.60	2.5042	S. 21 37 15.2	0.521
	THURSDAY 11.			
	h m s	s	° ′ ″	″
0	18 39 53.60	2.5042	S. 21 37 15.2	0.521
1	18 42 23.79	2.5020	21 37 42.2	0.380
2	18 44 53.84	2.4997	21 38 0.8	0.240
3	18 47 23.75	2.4973	21 38 11.0	− 0.100
4	18 49 53.52	2.4948	21 38 12.8	+ 0.040
5	18 52 23.13	2.4922	21 38 6.2	0.180
6	18 54 52.59	2.4896	21 37 51.2	0.319
7	18 57 21.89	2.4869	21 37 27.9	0.457
8	18 59 51.02	2.4842	21 36 56.4	0.594
9	19 2 19.99	2.4813	21 36 16.6	0.732
10	19 4 48.78	2.4783	21 35 28.6	0.869
11	19 7 17.39	2.4753	21 34 32.4	1.006
12	19 9 45.82	2.4722	21 33 27.9	1.142
13	19 12 14.06	2.4691	21 32 15.3	1.277
14	19 14 42.11	2.4659	21 30 54.7	1.411
15	19 17 9.97	2.4627	21 29 26.0	1.545
16	19 19 37.63	2.4593	21 27 49.3	1.679
17	19 22 5.08	2.4558	21 26 4.6	1.812
18	19 24 32.33	2.4523	21 24 11.9	1.944
19	19 26 59.36	2.4488	21 22 11.3	2.075
20	19 29 26.18	2.4452	21 20 2.9	2.205
21	19 31 52.78	2.4415	21 17 46.7	2.335
22	19 34 19.16	2.4377	21 15 22.7	2.465
23	19 36 45.31	2.4339	S. 21 12 50.9	2.594
	FRIDAY 12.			
0	19 39 11.23	2.4301	S. 21 10 11.4	2.722
1	19 41 36.92	2.4262	21 7 24.2	2.849
2	19 44 2.37	2.4222	21 4 29.5	2.975
3	19 46 27.58	2.4182	21 1 27.2	3.101
4	19 48 52.55	2.4141	20 58 17.4	3.225
5	19 51 17.27	2.4100	20 55 0.2	3.349
6	19 53 41.75	2.4058	20 51 35.5	3.473
7	19 56 5.97	2.4016	20 48 3.4	3.595
8	19 58 29.94	2.3973	20 44 24.1	3.716
9	20 0 53.65	2.3930	20 40 37.5	3.837
10	20 3 17.10	2.3887	20 36 43.7	3.957
11	20 5 40.29	2.3843	20 32 42.7	4.076
12	20 8 3.22	2.3799	20 28 34.6	4.193
13	20 10 25.88	2.3754	20 24 19.5	4.310
14	20 12 48.27	2.3709	20 19 57.4	4.427
15	20 15 10.39	2.3663	20 15 28.3	4.542
16	20 17 32.23	2.3618	20 10 52.4	4.656
17	20 19 53.80	2.3572	20 6 9.6	4.770
18	20 22 15.09	2.3525	20 1 20.0	4.882
19	20 24 36.10	2.3478	19 56 23.7	4.994
20	20 26 56.83	2.3432	19 51 20.7	5.104
21	20 29 17.28	2.3385	19 46 11.2	5.213
22	20 31 37.45	2.3337	19 40 55.1	5.322
23	20 33 57.33	2.3289	19 35 32.5	5.431
24	20 36 16.92	2.3241	S. 19 30 3.4	5.538

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY 13.			
	h m s	s	° ′ ″	″
0	20 36 16.92	2.3241	S. 19 30 3.4	5.538
1	20 38 36.22	2.3193	19 24 28.0	5.643
2	20 40 55.24	2.3146	19 18 46.2	5.748
3	20 43 13.97	2.3098	19 12 58.2	5.852
4	20 45 32.41	2.3048	19 7 4.0	5.954
5	20 47 50.55	2.2999	19 1 3.7	6.056
6	20 50 8.40	2.2951	18 54 57.3	6.157
7	20 52 25.96	2.2902	18 48 44.9	6.257
8	20 54 43.22	2.2853	18 42 26.5	6.356
9	20 57 0.19	2.2804	18 36 2.2	6.453
10	20 59 16.87	2.2755	18 29 32.1	6.550
11	21 1 33.25	2.2705	18 22 56.2	6.647
12	21 3 49.33	2.2656	18 16 14.5	6.742
13	21 6 5.12	2.2607	18 9 27.2	6.835
14	21 8 20.61	2.2557	18 2 34.3	6.927
15	21 10 35.80	2.2507	17 55 35.9	7.019
16	21 12 50.70	2.2458	17 48 32.0	7.110
17	21 15 5.30	2.2409	17 41 22.7	7.199
18	21 17 19.61	2.2360	17 34 8.1	7.288
19	21 19 33.62	2.2311	17 26 48.2	7.376
20	21 21 47.34	2.2262	17 19 23.0	7.462
21	21 24 0.76	2.2213	17 11 52.7	7.547
22	21 26 13.89	2.2164	17 4 17.3	7.632
23	21 28 26.73	2.2115	S. 16 56 36.8	7.716
	SUNDAY 14.			
0	21 30 39.27	2.2066	S. 16 48 51.4	7.798
1	21 32 51.52	2.2017	16 41 1.0	7.880
2	21 35 3.48	2.1969	16 33 5.8	7.960
3	21 37 15.15	2.1921	16 25 5.8	8.039
4	21 39 26.53	2.1872	16 17 1.1	8.117
5	21 41 37.62	2.1824	16 8 51.7	8.195
6	21 43 48.42	2.1777	16 0 37.7	8.271
7	21 45 58.94	2.1729	15 52 19.2	8.347
8	21 48 9.17	2.1681	15 43 56.1	8.421
9	21 50 19.11	2.1633	15 35 28.6	8.494
10	21 52 28.77	2.1586	15 26 56.8	8.567
11	21 54 38.15	2.1540	15 18 20.6	8.638
12	21 56 47.25	2.1493	15 9 40.2	8.708
13	21 58 56.07	2.1447	15 0 55.7	8.777
14	22 1 4.62	2.1402	14 52 7.0	8.846
15	22 3 12.89	2.1356	14 43 14.2	8.913
16	22 5 20.89	2.1310	14 34 17.4	8.979
17	22 7 28.61	2.1264	14 25 16.7	9.044
18	22 9 36.06	2.1219	14 16 12.1	9.108
19	22 11 43.24	2.1175	14 7 3.7	9.171
20	22 13 50.16	2.1131	13 57 51.5	9.233
21	22 15 56.81	2.1087	13 48 35.7	9.294
22	22 18 3.20	2.1042	13 39 16.2	9.355
23	22 20 9.32	2.0999	13 29 53.1	9.415
24	22 22 15.18	2.0956	S. 13 20 26.4	9.474
	MONDAY 15.			
0	22 22 15.18	2.0956	S. 13 20 26.4	9.474
1	22 24 20.79	2.0913	13 10 56.2	9.531
2	22 26 26.14	2.0871	13 1 22.7	9.586
3	22 28 31.24	2.0829	12 51 45.9	9.641
4	22 30 36.08	2.0787	12 42 5.8	9.696
5	22 32 40.68	2.0746	12 32 22.4	9.750
6	22 34 45.03	2.0705	12 22 35.8	9.802
7	22 36 49.14	2.0664	12 12 46.1	9.854
8	22 38 53.00	2.0623	12 2 53.3	9.904
9	22 40 56.62	2.0583	11 52 57.6	9.953
10	22 43 0.00	2.0544	11 42 58.9	10.002
11	22 45 3.15	2.0505	11 32 57.3	10.050
12	22 47 6.06	2.0466	11 22 52.9	10.097
13	22 49 8.74	2.0428	11 12 45.7	10.143
14	22 51 11.19	2.0390	11 2 35.7	10.188
15	22 53 13.42	2.0352	10 52 23.1	10.232
16	22 55 15.42	2.0315	10 42 7.9	10.275
17	22 57 17.20	2.0279	10 31 50.1	10.317
18	22 59 18.77	2.0243	10 21 29.8	10.359
19	23 1 20.12	2.0207	10 11 7.0	10.399
20	23 3 21.25	2.0171	10 0 41.9	10.438
21	23 5 22.17	2.0136	9 50 14.5	10.476
22	23 7 22.88	2.0102	9 39 44.8	10.514
23	23 9 23.39	2.0068	S. 9 29 12.8	10.551
	TUESDAY 16.			
0	23 11 23.70	2.0035	S. 9 18 38.7	10.586
1	23 13 23.81	2.0002	9 8 2.5	10.621
2	23 15 23.72	1.9969	8 57 24.2	10.656
3	23 17 23.43	1.9936	8 46 43.8	10.689
4	23 19 22.95	1.9904	8 36 1.5	10.721
5	23 21 22.28	1.9872	8 25 17.3	10.752
6	23 23 21.42	1.9842	8 14 31.2	10.783
7	23 25 20.38	1.9812	8 3 43.3	10.812
8	23 27 19.16	1.9782	7 52 53.7	10.841
9	23 29 17.76	1.9752	7 42 2.4	10.869
10	23 31 16.18	1.9723	7 31 9.4	10.897
11	23 33 14.43	1.9694	7 20 14.8	10.923
12	23 35 12.51	1.9666	7 9 18.7	10.948
13	23 37 10.42	1.9639	6 58 21.1	10.973
14	23 39 8.17	1.9612	6 47 22.0	10.997
15	23 41 5.76	1.9585	6 36 21.5	11.019
16	23 43 3.19	1.9558	6 25 19.7	11.041
17	23 45 0.46	1.9532	6 14 16.6	11.062
18	23 46 57.58	1.9507	6 3 12.3	11.082
19	23 48 54.55	1.9482	5 52 6.8	11.102
20	23 50 51.37	1.9457	5 41 0.1	11.120
21	23 52 48.04	1.9434	5 29 52.4	11.138
22	23 54 44.57	1.9411	5 18 43.6	11.155
23	23 56 40.97	1.9388	5 7 33.8	11.172
24	23 58 37.23	1.9366	S. 4 56 23.0	11.187

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 17.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	23 58 37.23	1.9366	S. 4 56 23.0	11.187
1	0 0 33.36	1.9344	4 45 11.3	11.202
2	0 2 29.36	1.9322	4 33 58.8	11.215
3	0 4 25.22	1.9300	4 22 45.5	11.228
4	0 6 20.96	1.9280	4 11 31.5	11.240
5	0 8 16.58	1.9260	4 0 16.7	11.252
6	0 10 12.08	1.9241	3 49 1.3	11.262
7	0 12 7.47	1.9222	3 37 45.3	11.272
8	0 14 2.74	1.9203	3 26 28.7	11.281
9	0 15 57.90	1.9185	3 15 11.6	11.289
10	0 17 52.96	1.9167	3 3 54.0	11.297
11	0 19 47.91	1.9150	2 52 36.0	11.303
12	0 21 42.76	1.9133	2 41 17.6	11.309
13	0 23 37.51	1.9117	2 29 58.9	11.314
14	0 25 32.17	1.9102	2 18 39.9	11.318
15	0 27 26.73	1.9086	2 7 20.7	11.322
16	0 29 21.20	1.9071	1 56 1.3	11.324
17	0 31 15.58	1.9057	1 44 41.8	11.326
18	0 33 9.88	1.9043	1 33 22.2	11.327
19	0 35 4.09	1.9029	1 22 2.5	11.328
20	0 36 58.23	1.9016	1 10 42.8	11.328
21	0 38 52.29	1.9004	0 59 23.1	11.327
22	0 40 46.28	1.8992	0 48 3.5	11.325
23	0 42 40.20	1.8981	S. 0 36 44.1	11.322

THURSDAY 18.

0	0 44 34.05	1.8970	S. 0 25 24.9	11.318
1	0 46 27.84	1.8959	0 14 5.9	11.314
2	0 48 21.56	1.8948	S. 0 2 47.2	11.310
3	0 50 15.22	1.8939	N. 0 8 31.3	11.305
4	0 52 8.83	1.8931	0 19 49.4	11.299
5	0 54 2.39	1.8922	0 31 7.1	11.292
6	0 55 55.89	1.8913	0 42 24.4	11.284
7	0 57 49.34	1.8905	0 53 41.2	11.275
8	0 59 42.75	1.8898	1 4 57.4	11.266
9	1 1 36.12	1.8892	1 16 13.1	11.257
10	1 3 29.45	1.8885	1 27 28.2	11.246
11	1 5 22.74	1.8879	1 38 42.6	11.234
12	1 7 16.00	1.8873	1 49 56.3	11.222
13	1 9 9.22	1.8867	2 1 9.3	11.210
14	1 11 2.41	1.8863	2 12 21.5	11.196
15	1 12 55.58	1.8860	2 23 32.8	11.181
16	1 14 48.73	1.8857	2 34 43.2	11.166
17	1 16 41.86	1.8853	2 45 52.7	11.151
18	1 18 34.97	1.8850	2 57 1.3	11.135
19	1 20 28.06	1.8848	3 8 8.9	11.117
20	1 22 21.14	1.8846	3 19 15.4	11.099
21	1 24 14.21	1.8844	3 30 20.8	11.081
22	1 26 7.27	1.8843	3 41 25.1	11.062
23	1 28 0.32	1.8842	3 52 28.2	11.042
24	1 29 53.37	1.8842	N. 4 3 30.1	11.022

FRIDAY 19.

	h m s	s	° ′ ″	″
0	1 29 53.37	1.8842	N. 4 3 30.1	11.022
1	1 31 46.42	1.8843	4 14 30.8	11.000
2	1 33 39.48	1.8843	4 25 30.1	10.978
3	1 35 32.54	1.8843	4 36 28.1	10.955
4	1 37 25.60	1.8845	4 47 24.7	10.932
5	1 39 18.68	1.8847	4 58 19.9	10.908
6	1 41 11.77	1.8850	5 9 13.7	10.884
7	1 43 4.88	1.8852	5 20 6.0	10.858
8	1 44 58.00	1.8855	5 30 56.7	10.832
9	1 46 51.14	1.8858	5 41 45.8	10.805
10	1 48 44.30	1.8862	5 52 33.3	10.777
11	1 50 37.49	1.8867	6 3 19.1	10.749
12	1 52 30.70	1.8871	6 14 3.2	10.721
13	1 54 23.94	1.8876	6 24 45.6	10.692
14	1 56 17.22	1.8882	6 35 26.2	10.661
15	1 58 10.53	1.8888	6 46 4.9	10.630
16	2 0 3.88	1.8895	6 56 41.8	10.598
17	2 1 57.27	1.8902	7 7 16.7	10.566
18	2 3 50.70	1.8908	7 17 49.7	10.533
19	2 5 44.17	1.8915	7 28 20.7	10.500
20	2 7 37.68	1.8923	7 38 49.7	10.466
21	2 9 31.24	1.8931	7 49 16.6	10.431
22	2 11 24.85	1.8940	7 59 41.4	10.395
23	2 13 18.52	1.8949	N. 8 10 4.0	10.358

SATURDAY 20.

0	2 15 12.24	1.8958	N. 8 20 24.4	10.321
1	2 17 6.02	1.8968	8 30 42.6	10.284
2	2 18 59.86	1.8978	8 40 58.5	10.246
3	2 20 53.76	1.8988	8 51 12.1	10.207
4	2 22 47.72	1.8998	9 1 23.4	10.168
5	2 24 41.74	1.9009	9 11 32.3	10.128
6	2 26 35.83	1.9021	9 21 38.7	10.087
7	2 28 29.99	1.9033	9 31 42.7	10.046
8	2 30 24.23	1.9046	9 41 44.2	10.003
9	2 32 18.54	1.9058	9 51 43.1	9.960
10	2 34 12.92	1.9070	10 1 39.4	9.917
11	2 36 7.38	1.9083	10 11 33.1	9.873
12	2 38 1.92	1.9097	10 21 24.2	9.829
13	2 39 56.54	1.9110	10 31 12.6	9.783
14	2 41 51.24	1.9124	10 40 58.2	9.737
15	2 43 46.03	1.9139	10 50 41.0	9.690
16	2 45 40.91	1.9153	11 0 21.0	9.642
17	2 47 35.88	1.9168	11 9 58.1	9.594
18	2 49 30.93	1.9183	11 19 32.3	9.546
19	2 51 26.08	1.9199	11 29 3.6	9.497
20	2 53 21.32	1.9215	11 38 32.0	9.448
21	2 55 16.66	1.9232	11 47 57.4	9.397
22	2 57 12.10	1.9247	11 57 19.7	9.346
23	2 59 7.63	1.9263	12 6 38.9	9.294
24	3 1 3.26	1.9280	N. 12 15 55.0	9.242

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 21.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	3 1 3.26	1.9280	N.12 15 55.0	9.242
1	3 2 58.99	1.9298	12 25 8.0	9.189
2	3 4 54.83	1.9316	12 34 17.7	9.135
3	3 6 50.78	1.9334	12 43 24.2	9.081
4	3 8 46.84	1.9352	12 52 27.4	9.026
5	3 10 43.00	1.9369	13 1 27.3	8.971
6	3 12 39.27	1.9388	13 10 23.9	8.915
7	3 14 35.65	1.9407	13 19 17.1	8.858
8	3 16 32.15	1.9426	13 28 6.8	8.800
9	3 18 28.76	1.9445	13 36 53.1	8.742
10	3 20 25.49	1.9465	13 45 35.9	8.684
11	3 22 22.34	1.9484	13 54 15.2	8.625
12	3 24 19.30	1.9503	14 2 50.9	8.565
13	3 26 16.38	1.9523	14 11 23.0	8.505
14	3 28 13.58	1.9544	14 19 51.5	8.444
15	3 30 10.91	1.9565	14 28 16.3	8.382
16	3 32 8.36	1.9585	14 36 37.4	8.320
17	3 34 5.93	1.9606	14 44 54.7	8.257
18	3 36 3.63	1.9627	14 53 8.2	8.193
19	3 38 1.46	1.9648	15 1 17.9	8.129
20	3 39 59.41	1.9669	15 9 23.7	8.065
21	3 41 57.49	1.9691	15 17 25.7	8.001
22	3 43 55.70	1.9713	15 25 23.8	7.935
23	3 45 54.04	1.9735	N.15 33 17.9	7.868

MONDAY 22.

0	3 47 52.52	1.9757	N.15 41 7.9	7.800
1	3 49 51.13	1.9779	15 48 53.9	7.732
2	3 51 49.87	1.9801	15 56 35.8	7.664
3	3 53 48.74	1.9823	16 4 13.6	7.596
4	3 55 47.75	1.9846	16 11 47.3	7.527
5	3 57 46.90	1.9869	16 19 16.9	7.458
6	3 59 46.18	1.9892	16 26 42.3	7.387
7	4 1 45.60	1.9915	16 34 3.4	7.316
8	4 3 45.16	1.9938	16 41 20.2	7.244
9	4 5 44.86	1.9962	16 48 32.6	7.171
10	4 7 44.70	1.9985	16 55 40.7	7.099
11	4 9 44.68	2.0008	17 2 44.4	7.026
12	4 11 44.79	2.0031	17 9 43.8	6.952
13	4 13 45.05	2.0055	17 16 38.7	6.877
14	4 15 45.45	2.0078	17 23 29.1	6.802
15	4 17 45.99	2.0102	17 30 15.0	6.727
16	4 19 46.67	2.0126	17 36 56.3	6.650
17	4 21 47.50	2.0150	17 43 33.0	6.573
18	4 23 48.47	2.0173	17 50 5.1	6.496
19	4 25 49.58	2.0197	17 56 32.5	6.419
20	4 27 50.84	2.0221	18 2 55.3	6.341
21	4 29 52.24	2.0245	18 9 13.4	6.262
22	4 31 53.78	2.0269	18 15 26.7	6.182
23	4 33 55.47	2.0293	18 21 35.2	6.102
24	4 35 57.30	2.0318	N.18 27 39.0	6.022

TUESDAY 23.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	4 35 57.30	2.0318	N.18 27 39.0	6.022
1	4 37 59.28	2.0342	18 33 37.9	5.941
2	4 40 1.40	2.0365	18 39 31.9	5.859
3	4 42 3.66	2.0389	18 45 21.0	5.777
4	4 44 6.07	2.0413	18 51 5.2	5.695
5	4 46 8.62	2.0437	18 56 44.4	5.612
6	4 48 11.31	2.0461	19 2 18.6	5.528
7	4 50 14.15	2.0485	19 7 47.8	5.444
8	4 52 17.13	2.0509	19 13 11.9	5.360
9	4 54 20.26	2.0533	19 18 31.0	5.275
10	4 56 23.53	2.0557	19 23 44.9	5.189
11	4 58 26.94	2.0580	19 28 53.7	5.103
12	5 0 30.49	2.0603	19 33 57.3	5.016
13	5 2 34.18	2.0627	19 38 55.7	4.929
14	5 4 38.01	2.0651	19 43 48.8	4.842
15	5 6 41.99	2.0675	19 48 36.7	4.754
16	5 8 46.11	2.0698	19 53 19.3	4.666
17	5 10 50.37	2.0722	19 57 56.6	4.577
18	5 12 54.77	2.0745	20 2 28.5	4.487
19	5 14 59.31	2.0768	20 6 55.0	4.397
20	5 17 3.98	2.0790	20 11 16.1	4.307
21	5 19 8.79	2.0813	20 15 31.8	4.216
22	5 21 13.74	2.0836	20 19 42.0	4.125
23	5 23 18.82	2.0858	N.20 23 46.8	4.034

WEDNESDAY 24.

0	5 25 24.04	2.0881	N.20 27 46.1	3.942
1	5 27 29.39	2.0903	20 31 39.8	3.849
2	5 29 34.88	2.0926	20 35 27.9	3.756
3	5 31 40.50	2.0948	20 39 10.5	3.662
4	5 33 46.25	2.0969	20 42 47.4	3.568
5	5 35 52.13	2.0991	20 46 18.7	3.474
6	5 37 58.14	2.1012	20 49 44.3	3.379
7	5 40 4.28	2.1034	20 53 4.2	3.284
8	5 42 10.55	2.1056	20 56 18.4	3.188
9	5 44 16.95	2.1077	20 59 26.8	3.093
10	5 46 23.47	2.1097	21 2 29.5	2.998
11	5 48 30.11	2.1117	21 5 26.5	2.902
12	5 50 36.88	2.1138	21 8 17.7	2.804
13	5 52 43.77	2.1158	21 11 3.0	2.706
14	5 54 50.78	2.1178	21 13 42.4	2.609
15	5 56 57.91	2.1198	21 16 16.0	2.511
16	5 59 5.16	2.1218	21 18 43.7	2.412
17	6 1 12.53	2.1237	21 21 5.4	2.312
18	6 3 20.01	2.1257	21 23 21.2	2.213
19	6 5 27.61	2.1276	21 25 31.0	2.114
20	6 7 35.32	2.1294	21 27 34.9	2.015
21	6 9 43.14	2.1312	21 29 32.8	1.915
22	6 11 51.07	2.1331	21 31 24.7	1.814
23	6 13 59.11	2.1349	21 33 10.5	1.713
24	6 16 7.26	2.1367	N.21 34 50.3	1.612

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	THURSDAY 25.			
	h m s	s	° ′ ″	″
0	6 16 7.26	2.1367	N.21 34 50.3	1.612
1	6 18 15.51	2.1384	21 36 24.0	1.511
2	6 20 23.87	2.1401	21 37 51.6	1.409
3	6 22 32.33	2.1418	21 39 13.1	1.307
4	6 24 40.89	2.1435	21 40 28.5	1.205
5	6 26 49.55	2.1452	21 41 37.7	1.102
6	6 28 58.31	2.1468	21 42 40.8	1.000
7	6 31 7.17	2.1484	21 43 37.7	0.897
8	6 33 16.12	2.1499	21 44 28.4	0.793
9	6 35 25.16	2.1515	21 45 12.9	0.690
10	6 37 34.30	2.1530	21 45 51.2	0.586
11	6 39 43.52	2.1544	21 46 23.2	0.482
12	6 41 52.83	2.1559	21 46 49.0	0.378
13	6 44 2.23	2.1573	21 47 8.5	0.273
14	6 46 11.71	2.1588	21 47 21.7	0.169
15	6 48 21.28	2.1602	21 47 28.7	+ 0.064
16	6 50 30.93	2.1615	21 47 29.4	− 0.042
17	6 52 40.66	2.1628	21 47 23.7	0.148
18	6 54 50.47	2.1641	21 47 11.6	0.254
19	6 57 0.35	2.1653	21 46 53.2	0.359
20	6 59 10.31	2.1666	21 46 28.5	0.464
21	7 1 20.34	2.1678	21 45 57.5	0.570
22	7 3 30.44	2.1689	21 45 20.1	0.677
23	7 5 40.61	2.1701	N.21 44 36.3	0.783
	FRIDAY 26.			
0	7 7 50.85	2.1712	N.21 43 46.1	0.890
1	7 10 1.16	2.1723	21 42 49.5	0.997
2	7 12 11.53	2.1733	21 41 46.5	1.103
3	7 14 21.96	2.1743	21 40 37.1	1.210
4	7 16 32.45	2.1753	21 39 21.3	1.317
5	7 18 43.00	2.1763	21 37 59.1	1.424
6	7 20 53.61	2.1772	21 36 30.4	1.532
7	7 23 4.27	2.1782	21 34 55.3	1.639
8	7 25 14.99	2.1791	21 33 13.7	1.747
9	7 27 25.76	2.1799	21 31 25.7	1.854
10	7 29 36.58	2.1807	21 29 31.2	1.962
11	7 31 47.45	2.1815	21 27 30.3	2.069
12	7 33 58.36	2.1822	21 25 22.9	2.177
13	7 36 9.31	2.1829	21 23 9.0	2.285
14	7 38 20.31	2.1837	21 20 48.7	2.393
15	7 40 31.36	2.1845	21 18 21.9	2.501
16	7 42 42.45	2.1851	21 15 48.6	2.608
17	7 44 53.57	2.1857	21 13 8.9	2.716
18	7 47 4.73	2.1863	21 10 22.7	2.823
19	7 49 15.93	2.1869	21 7 30.1	2.931
20	7 51 27.16	2.1874	21 4 31.0	3.039
21	7 53 38.42	2.1879	21 1 25.4	3.147
22	7 55 49.71	2.1884	20 58 13.4	3.254
23	7 58 1.03	2.1889	20 54 54.9	3.362
24	8 0 12.38	2.1894	N.20 51 29.9	3.470

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY 27.			
	h m s	s	° ′ ″	″
0	8 0 12.38	2.1894	N.20 51 29.9	3.470
1	8 2 23.76	2.1898	20 47 58.5	3.578
2	8 4 35.16	2.1902	20 44 20.6	3.686
3	8 6 46.58	2.1906	20 40 36.2	3.793
4	8 8 58.03	2.1910	20 36 45.4	3.901
5	8 11 9.50	2.1913	20 32 48.1	4.008
6	8 13 20.98	2.1915	20 28 44.4	4.115
7	8 15 32.48	2.1918	20 24 34.3	4.222
8	8 17 44.00	2.1921	20 20 17.7	4.330
9	8 19 55.54	2.1924	20 15 54.7	4.437
10	8 22 7.09	2.1926	20 11 25.3	4.543
11	8 24 18.65	2.1927	20 6 49.5	4.650
12	8 26 30.22	2.1929	20 2 7.3	4.757
13	8 28 41.80	2.1931	19 57 18.7	4.863
14	8 30 53.39	2.1933	19 52 23.7	4.969
15	8 33 5.00	2.1935	19 47 22.4	5.075
16	8 35 16.61	2.1936	19 42 14.7	5.181
17	8 37 28.23	2.1937	19 37 0.7	5.287
18	8 39 39.85	2.1937	19 31 40.3	5.393
19	8 41 51.48	2.1938	19 26 13.6	5.498
20	8 44 3.11	2.1938	19 20 40.6	5.604
21	8 46 14.74	2.1938	19 15 1.2	5.709
22	8 48 26.37	2.1938	19 9 15.5	5.813
23	8 50 38.00	2.1939	N.19 3 23.6	5.917
	SUNDAY 28.			
0	8 52 49.64	2.1940	N.18 57 25.5	6.021
1	8 55 1.28	2.1939	18 51 21.1	6.125
2	8 57 12.91	2.1938	18 45 10.5	6.229
3	8 59 24.54	2.1938	18 38 53.6	6.333
4	9 1 36.17	2.1938	18 32 30.5	6.436
5	9 3 47.80	2.1937	18 26 1.3	6.538
6	9 5 59.42	2.1937	18 19 26.0	6.640
7	9 8 11.04	2.1937	18 12 44.5	6.743
8	9 10 22.66	2.1936	18 5 56.8	6.846
9	9 12 34.27	2.1935	17 59 3.0	6.947
10	9 14 45.88	2.1934	17 52 3.2	7.047
11	9 16 57.48	2.1933	17 44 57.4	7.148
12	9 19 9.07	2.1932	17 37 45.5	7.248
13	9 21 20.66	2.1931	17 30 27.6	7.348
14	9 23 32.24	2.1930	17 23 3.7	7.449
15	9 25 43.82	2.1929	17 15 33.7	7.549
16	9 27 55.39	2.1928	17 7 57.8	7.648
17	9 30 6.96	2.1927	17 0 16.0	7.746
18	9 32 18.52	2.1927	16 52 28.3	7.844
19	9 34 30.08	2.1926	16 44 34.7	7.942
20	9 36 41.63	2.1924	16 36 35.3	8.039
21	9 38 53.17	2.1923	16 28 30.1	8.136
22	9 41 4.71	2.1922	16 20 19.0	8.233
23	9 43 16.24	2.1922	16 12 2.1	8.330
24	9 45 27.77	2.1921	N.16 3 39.4	8.426

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	MONDAY 29.			
	h m s	s	° ′ ″	″
0	9 45 27.77	2.1921	N.16 3 39.4	8.426
1	9 47 39.29	2.1920	15 55 11.0	8.520
2	9 49 50.81	2.1920	15 46 37.0	8.614
3	9 52 2.33	2.1919	15 37 57.3	8.708
4	9 54 13.84	2.1918	15 29 12.0	8.802
5	9 56 25.35	2.1918	15 20 21.1	8.895
6	9 58 36.86	2.1918	15 11 24.6	8.988
7	10 0 48.37	2.1917	15 2 22.5	9.081
8	10 2 59.87	2.1917	14 53 14.9	9.172
9	10 5 11.37	2.1917	14 44 1.9	9.262
10	10 7 22.87	2.1917	14 34 43.5	9.352
11	10 9 34.38	2.1918	14 25 19.7	9.442
12	10 11 45.89	2.1918	14 15 50.5	9.531
13	10 13 57.40	2.1918	14 6 16.0	9.620
14	10 16 8.91	2.1919	13 56 36.1	9.709
15	10 18 20.43	2.1921	13 46 50.9	9.797
16	10 20 31.96	2.1922	13 37 0.5	9.883
17	10 22 43.49	2.1923	13 27 5.0	9.969
18	10 24 55.03	2.1924	13 17 4.3	10.054
19	10 27 6.58	2.1926	13 6 58.5	10.139
20	10 29 18.14	2.1928	12 56 47.6	10.223
21	10 31 29.71	2.1930	12 46 31.7	10.307
22	10 33 41.30	2.1932	12 36 10.8	10.389
23	10 35 52.90	2.1934	N.12 25 45.0	10.471
	TUESDAY 30.			
0	10 38 4.51	2.1937	N.12 15 14.3	10.552
1	10 40 16.14	2.1940	12 4 38.7	10.633
2	10 42 27.79	2.1943	11 53 58.3	10.713
3	10 44 39.46	2.1947	11 43 13.2	10.792
4	10 46 51.15	2.1950	11 32 23.3	10.871
5	10 49 2.86	2.1954	11 21 28.7	10.948
6	10 51 14.60	2.1958	11 10 29.5	11.025
7	10 53 26.36	2.1962	10 59 25.7	11.101
8	10 55 38.15	2.1967	10 48 17.4	11.176
9	10 57 49.97	2.1972	10 37 4.6	11.251
10	11 0 1.82	2.1978	10 25 47.3	11.325
11	11 2 13.71	2.1984	10 14 25.6	11.397
12	11 4 25.63	2.1989	10 2 59.6	11.469
13	11 6 37.58	2.1996	9 51 29.3	11.540
14	11 8 49.58	2.2003	9 39 54.8	11.610
15	11 11 1.62	2.2010	9 28 16.1	11.679
16	11 13 13.70	2.2017	9 16 33.3	11.747
17	11 15 25.83	2.2025	9 4 46.4	11.815
18	11 17 38.00	2.2033	8 52 55.5	11.882
19	11 19 50.22	2.2041	8 41 0.6	11.948
20	11 22 2.49	2.2049	8 29 1.8	12.011
21	11 24 14.81	2.2058	8 16 59.2	12.074
22	11 26 27.19	2.2068	8 4 52.9	12.137
23	11 28 39.63	2.2077	7 52 42.8	12.199
24	11 30 52.12	2.2087	N. 7 40 29.0	12.260

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	WEDNESDAY 31.			
	h m s	s	° ′ ″	″
0	11 30 52.12	2.2087	N. 7 40 29.0	12.260
1	11 33 4.68	2.2098	7 28 11.6	12.320
2	11 35 17.30	2.2109	7 15 50.6	12.378
3	11 37 29.99	2.2121	7 3 26.2	12.435
4	11 39 42.75	2.2132	6 50 58.4	12.492
5	11 41 55.58	2.2144	6 38 27.2	12.547
6	11 44 8.48	2.2157	6 25 52.7	12.601
7	11 46 21.46	2.2170	6 13 15.0	12.654
8	11 48 34.52	2.2183	6 0 34.2	12.707
9	11 50 47.65	2.2196	5 47 50.2	12.758
10	11 53 0.87	2.2211	5 35 3.2	12.807
11	11 55 14.18	2.2226	5 22 13.3	12.856
12	11 57 27.58	2.2241	5 9 20.5	12.903
13	11 59 41.07	2.2256	4 56 24.9	12.950
14	12 1 54.65	2.2271	4 43 26.5	12.995
15	12 4 8.32	2.2287	4 30 25.5	13.039
16	12 6 22.09	2.2304	4 17 21.9	13.082
17	12 8 35.97	2.2322	4 4 15.7	13.123
18	12 10 49.95	2.2339	3 51 7.1	13.163
19	12 13 4.04	2.2357	3 37 56.1	13.202
20	12 15 18.24	2.2376	3 24 42.8	13.240
21	12 17 32.55	2.2394	3 11 27.3	13.276
22	12 19 46.97	2.2413	2 58 9.7	13.311
23	12 22 1.51	2.2433	N. 2 44 50.0	13.345
	THURSDAY, NOVEMBER 1.			
0	12 24 16.17	2.2453	N. 2 31 28.3	13.377

PHASES OF THE MOON.

		d	h	m
●	New Moon. . . Oct.	5	2	34.2
☽	First Quarter	11	17	29.0
○	Full Moon	19	9	9.0
☾	Last Quarter	27	13	55.7

		d	h
☾	Perigee . . . . Oct.	6	18.9
☾	Apogee	22	10.2

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	III^{h}.	P. L. of Diff.	VI^{h}.	P. L. of Diff.	IX^{h}.	P. L. of Diff.
1	Aldebaran	W.	67° 7′ 7″	2597	68° 46′ 6″	2579	70° 25′ 30″	2561	72° 5′ 19″	2543
	Pollux	W.	23 53 59	2800	25 28 27	2758	27 3 50	2721	28 40 2	2687
	Sun	E.	53 39 35	2957	52 8 28	2939	50 36 58	2920	49 5 5	2903
2	Aldebaran	W.	80 30 39	2453	82 12 58	2435	83 55 43	2417	85 38 53	2401
	Pollux	W.	36 51 39	2544	38 31 51	2520	40 12 37	2496	41 53 56	2473
	Sun	E.	41 19 59	2815	39 45 50	2798	38 11 20	2782	36 36 29	2767
3	Aldebaran	W.	94 20 51	2316	96 6 27	2300	97 52 26	2285	99 38 48	2269
	Pollux	W.	50 28 10	2371	52 12 27	2352	53 57 11	2334	55 42 21	2316
	Sun	E.	28 37 30	2703	27 0 54	2695	25 24 7	2689	23 47 12	2685
7	Sun	W.	26 50 27	2434	28 33 13	2429	30 16 7	2425	31 59 6	2424
	α Aquilæ	E.	78 9 4	2698	76 32 21	2711	74 55 56	2725	73 19 50	2742
	Fomalhaut	E.	111 32 0	2317	109 46 26	2313	108 0 46	2311	106 15 3	2311
8	Sun	W.	40 33 54	2435	42 16 39	2441	43 59 16	2446	45 41 45	2453
	Venus	W.	17 11 29	2643	18 49 25	2624	20 27 48	2611	22 6 28	2604
	α Aquilæ	E.	65 25 50	2861	63 52 41	2893	62 20 13	2927	60 48 29	2965
	Fomalhaut	E.	97 26 40	2322	95 41 13	2328	93 55 54	2334	92 10 44	2342
9	Sun	W.	54 11 31	2496	55 52 50	2506	57 33 55	2516	59 14 46	2527
	Venus	W.	30 20 52	2610	31 59 34	2615	33 38 8	2622	35 16 33	2630
	α Aquilæ	E.	53 23 11	3214	51 57 19	3279	50 32 43	3350	49 9 29	3427
	Fomalhaut	E.	83 27 58	2391	81 44 10	2403	80 0 40	2416	78 17 28	2430
	α Pegasi	E.	99 19 13	2551	97 39 10	2558	95 59 17	2566	94 19 35	2575
10	Sun	W.	67 35 1	2587	69 14 14	2600	70 53 9	2613	72 31 46	2626
	Venus	W.	43 25 32	2681	45 2 37	2693	46 39 26	2705	48 15 59	2718
	Jupiter	W.	20 33 12	2372	22 17 27	2376	24 1 36	2382	25 45 37	2389
	Fomalhaut	E.	69 46 47	2512	68 5 50	2530	66 25 19	2550	64 45 15	2570
	α Pegasi	E.	86 4 40	2635	84 26 32	2649	82 48 44	2665	81 11 17	2681
11	Sun	W.	80 40 18	2695	82 17 5	2708	83 53 34	2722	85 29 44	2737
	Venus	W.	56 14 30	2783	57 49 20	2797	59 23 52	2810	60 58 7	2824
	Jupiter	W.	34 22 35	2439	36 5 14	2450	37 47 37	2462	39 29 44	2474
	Mars	W.	18 15 11	2721	19 51 23	2715	21 27 43	2713	23 4 6	2714
	Fomalhaut	E.	56 32 24	2689	54 55 29	2716	53 19 11	2746	51 43 32	2776
	α Pegasi	E.	73 9 50	2775	71 34 50	2797	70 0 18	2820	68 26 16	2843
12	Sun	W.	93 25 56	2807	95 0 15	2820	96 34 17	2834	98 8 1	2848
	Venus	W.	68 44 55	2893	70 17 23	2906	71 49 34	2920	73 21 27	2934
	Jupiter	W.	47 56 5	2534	49 36 31	2547	51 16 39	2559	52 56 30	2572
	Antares	W.	45 2 27	2551	46 42 30	2559	48 22 22	2566	50 2 3	2575
	Mars	W.	31 4 41	2747	32 40 19	2756	34 15 45	2766	35 50 58	2776
	Fomalhaut	E.	43 56 9	2964	42 25 11	3010	40 55 11	3061	39 26 14	3117
	α Pegasi	E.	60 44 8	2979	59 13 29	3010	57 43 29	3043	56 14 10	3079
13	Sun	W.	105 52 15	2915	107 24 15	2928	108 55 58	2942	110 27 24	2955
	Venus	W.	80 56 39	3000	82 26 52	3014	83 56 48	3026	85 26 28	3039
	Jupiter	W.	61 11 34	2632	62 49 45	2643	64 27 41	2655	66 5 31	2667
	Antares	W.	58 17 22	2622	59 55 47	2632	61 33 58	2642	63 11 56	2652

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^h.	P. L. of Diff.	XVIII^h.	P. L. of Diff.	XXI^h.	P. L. of Diff.
1	Aldebaran	W.	73° 45′ 33″	2525	75° 26′ 12″	2507	77° 7′ 16″	2489	78° 48′ 45″	2471
	Pollux	W.	30 17 0	2655	31 54 41	2625	33 33 2	2596	35 12 2	2569
	Sun	E.	47 32 50	2885	46 0 12	2866	44 27 10	2849	42 53 46	2831
2	Aldebaran	W.	87 22 27	2383	89 6 26	2366	90 50 50	2349	92 35 38	2332
	Pollux	W.	43 35 47	2451	45 18 9	2430	47 1 1	2410	48 44 21	2390
	Sun	E.	35 1 18	2752	33 25 47	2738	31 49 58	2725	30 13 52	2713
3	Aldebaran	W.	101 25 33	2254	103 12 40	2240	105 0 8	2226	106 47 57	2212
	Pollux	W.	57 27 57	2300	59 13 57	2283	61 0 21	2268	62 47 8	2253
	Sun	E.	22 10 12	2685	20 33 12	2689	18 56 18	2701	17 19 39	2722
7	Sun	W.	33 42 7	2424	35 25 8	2425	37 8 7	2427	38 51 3	2431
	α Aquilæ	E.	71 44 6	2761	70 8 47	2782	68 33 56	2806	66 59 36	2832
	Fomalhaut	E.	104 29 19	2311	102 43 35	2312	100 57 53	2314	99 12 14	2317
8	Sun	W.	47 24 5	2460	49 6 14	2468	50 48 12	2477	52 29 58	2486
	Venus	W.	23 45 18	2600	25 24 13	2599	27 3 9	2601	28 42 3	2604
	α Aquilæ	E.	59 17 33	3007	57 47 29	3052	56 18 21	3101	54 50 13	3156
	Fomalhaut	E.	90 25 45	2349	88 40 57	2358	86 56 22	2368	85 12 2	2380
9	Sun	W.	60 55 22	2538	62 35 42	2551	64 15 45	2563	65 55 31	2574
	Venus	W.	36 54 47	2639	38 32 49	2649	40 10 38	2660	41 48 12	2670
	α Aquilæ	E.	47 47 43	3511	46 27 31	3604	45 9 1	3707	43 52 21	3822
	Fomalhaut	E.	76 34 36	2445	74 52 5	2460	73 9 56	2477	71 28 10	2493
	α Pegasi	E.	92 40 6	2585	91 0 51	2596	89 21 51	2608	87 43 7	2621
10	Sun	W.	74 10 5	2640	75 48 6	2654	77 25 48	2667	79 3 12	2681
	Venus	W.	49 52 15	2730	51 28 15	2743	53 3 58	2756	54 39 23	2770
	Jupiter	W.	27 29 27	2398	29 13 5	2407	30 56 30	2417	32 39 40	2428
	Fomalhaut	E.	63 5 39	2591	61 26 32	2614	59 47 56	2638	58 9 53	2663
	α Pegasi	E.	79 34 11	2698	77 57 28	2716	76 21 10	2735	74 45 17	2755
11	Sun	W.	87 5 35	2750	88 41 8	2764	90 16 23	2779	91 51 19	2793
	Venus	W.	62 32 4	2838	64 5 43	2851	65 39 5	2865	67 12 9	2879
	Jupiter	W.	41 11 34	2486	42 53 7	2498	44 34 23	2510	46 15 22	2522
	Mars	W.	24 40 27	2718	26 16 43	2723	27 52 52	2730	29 28 52	2738
	Fomalhaut	E.	50 8 33	2808	48 34 16	2843	47 0 44	2881	45 28 1	2921
	α Pegasi	E.	66 52 44	2868	65 19 44	2894	63 47 17	2921	62 15 25	2949
12	Sun	W.	99 41 27	2862	101 14 35	2875	102 47 26	2889	104 19 59	2902
	Venus	W.	74 53 3	2947	76 24 22	2961	77 55 24	2973	79 26 10	2987
	Jupiter	W.	54 36 4	2583	56 15 22	2596	57 54 23	2608	59 33 7	2621
	Antares	W.	51 41 32	2584	53 20 49	2593	54 59 53	2603	56 38 44	2612
	Mars	W.	37 25 57	2787	39 0 42	2797	40 35 14	2808	42 9 32	2819
	Fomalhaut	E.	37 58 25	3178	36 31 50	3246	35 6 35	3321	33 42 48	3405
	α Pegasi	E.	54 45 35	3116	53 17 45	3155	51 50 42	3198	50 24 30	3243
13	Sun	W.	111 58 33	2968	113 29 26	2980	115 0 4	2993	116 30 26	3005
	Venus	W.	86 55 53	3051	88 25 3	3064	89 53 57	3077	91 22 35	3089
	Jupiter	W.	67 42 45	2679	69 19 53	2689	70 56 47	2701	72 33 26	2712
	Antares	W.	64 49 40	2662	66 27 11	2672	68 4 29	2681	69 41 34	2692

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
13	Mars	W.	43° 43′ 35″	2830	45° 17′ 24″	2841	46° 50′ 59″	2852	48° 24′ 19″	2863
	α Pegasi	E.	48 59 12	3291	47 34 50	3343	46 11 28	3399	44 49 10	3460
	α Arietis	E.	89 48 26	2709	88 11 58	2721	86 35 46	2733	84 59 50	2746
14	Sun	W.	118 0 32	3018	119 30 23	3030	120 59 58	3043	122 29 18	3054
	Venus	W.	92 50 58	3101	94 19 7	3113	95 47 1	3124	97 14 41	3136
	Jupiter	W.	74 9 50	2723	75 45 59	2734	77 21 54	2744	78 57 35	2755
	Antares	W.	71 18 25	2701	72 55 3	2711	74 31 28	2721	76 7 40	2731
	Mars	W.	56 7 27	2918	57 39 23	2928	59 11 6	2939	60 42 35	2950
	α Arietis	E.	77 4 19	2809	75 30 3	2822	73 56 4	2835	72 22 22	2848
	Aldebaran	E.	108 20 11	2652	106 42 27	2663	105 4 58	2675	103 27 44	2685
15	Jupiter	W.	86 52 35	2805	88 26 56	2815	90 1 4	2825	91 35 0	2834
	Antares	W.	84 5 28	2778	85 40 25	2788	87 15 9	2797	88 49 41	2806
	Mars	W.	68 16 45	3001	69 46 57	3010	71 16 57	3020	72 46 45	3029
	α Aquilæ	W.	44 41 34	4155	45 50 43	4088	47 0 56	4029	48 12 7	3975
	α Arietis	E.	64 38 14	2919	63 6 19	2933	61 34 42	2948	60 3 24	2964
	Aldebaran	E.	95 24 56	2734	93 49 1	2744	92 13 19	2753	90 37 50	2763
16	Jupiter	W.	99 21 41	2880	100 54 26	2887	102 27 1	2896	103 59 25	2905
	Antares	W.	96 39 24	2851	98 12 46	2859	99 45 57	2868	101 18 57	2876
	Mars	W.	80 12 53	3075	81 41 33	3083	83 10 3	3092	84 38 22	3101
	α Aquilæ	W.	54 19 44	3781	55 35 6	3753	56 50 57	3727	58 7 15	3705
	α Arietis	E.	52 32 2	3051	51 2 52	3070	49 34 6	3090	48 5 44	3111
	Aldebaran	E.	82 43 21	2806	81 9 1	2815	79 34 52	2823	78 0 54	2831
17	Mars	W.	91 57 22	3142	93 24 41	3150	94 51 50	3158	96 18 50	3166
	α Aquilæ	W.	64 33 52	3626	65 51 58	3615	67 10 16	3606	68 28 44	3598
	α Arietis	E.	40 51 2	3244	39 25 45	3276	38 1 6	3313	36 37 9	3352
	Aldebaran	E.	70 13 39	2870	68 40 42	2878	67 7 55	2885	65 35 17	2893
18	α Aquilæ	W.	75 2 47	3576	76 21 48	3574	77 40 51	3573	78 59 55	3573
	Fomalhaut	W.	40 6 35	3483	41 27 18	3456	42 48 31	3434	44 10 9	3414
	Aldebaran	E.	57 54 25	2927	56 22 41	2934	54 51 5	2941	53 19 38	2947
	Pollux	E.	102 3 1	2958	100 31 56	2965	99 0 59	2971	97 30 10	2977
19	α Aquilæ	W.	85 35 1	3583	86 53 54	3587	88 12 42	3592	89 31 25	3598
	Fomalhaut	W.	51 3 13	3345	52 26 33	3335	53 50 4	3327	55 13 44	3320
	α Pegasi	W.	38 33 49	4082	39 44 8	4020	40 55 28	3964	42 7 43	3914
	Aldebaran	E.	45 44 23	2978	44 13 43	2985	42 43 11	2990	41 12 46	2997
	Pollux	E.	89 57 59	3007	88 27 55	3013	86 57 58	3018	85 28 8	3024
20	Fomalhaut	W.	62 13 42	3299	63 37 55	3296	65 2 11	3294	66 26 29	3293
	α Pegasi	W.	48 20 6	3731	49 36 20	3705	50 53 2	3681	52 10 9	3660
	Aldebaran	E.	33 42 30	3024	32 12 47	3030	30 43 11	3035	29 13 42	3041
	Pollux	E.	78 0 42	3052	76 31 33	3056	75 2 30	3061	73 33 33	3066
21	Fomalhaut	W.	73 28 22	3289	74 52 46	3289	76 17 10	3289	77 41 34	3290
	α Pegasi	W.	58 40 50	3579	59 59 47	3566	61 18 58	3555	62 38 21	3545
	Pollux	E.	66 10 18	3090	64 41 56	3094	63 13 39	3099	61 45 28	3103
	Saturn	E.	92 34 45	3077	91 6 7	3081	89 37 34	3084	88 9 5	3087
	Regulus	E.	101 54 35	3054	100 25 29	3058	98 56 28	3061	97 27 31	3064

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^h.	P. L. of Diff.	XVIII^h.	P. L. of Diff.	XXI^h.	P. L. of Diff.
13	MARS	W.	49° 57′ 25″	2874	51° 30′ 17″	2886	53° 2′ 54″	2897	54° 35′ 17″	2907
	α Pegasi	E.	43 28 1	3526	42 8 6	3598	40 49 29	3676	39 32 16	3763
	α Arietis	E.	83 24 11	2758	81 48 48	2771	80 13 42	2783	78 38 52	2796
14	SUN	W.	123 58 24	3066	125 27 15	3078	126 55 51	3090	128 24 13	3102
	VENUS	W.	98 42 7	3148	100 9 19	3158	101 36 18	3169	103 3 4	3181
	JUPITER	W.	80 33 2	2765	82 8 16	2775	83 43 16	2786	85 18 2	2796
	Antares	W.	77 43 39	2741	79 19 25	2750	80 54 58	2760	82 30 19	2769
	MARS	W.	62 13 51	2960	63 44 54	2970	65 15 44	2981	66 46 21	2991
	α Arietis	E.	70 48 57	2862	69 15 50	2876	67 43 0	2890	66 10 28	2904
	Aldebaran	E.	101 50 44	2695	100 13 57	2704	98 37 23	2715	97 1 3	2725
15	JUPITER	W.	93 8 44	2843	94 42 16	2852	96 15 36	2862	97 48 44	2870
	Antares	W.	90 24 1	2815	91 58 9	2824	93 32 6	2833	95 5 51	2842
	MARS	W.	74 16 22	3039	75 45 47	3048	77 15 0	3057	78 44 2	3066
	α Aquilæ	W.	49 24 11	3927	50 37 3	3884	51 50 39	3846	53 4 54	3812
	α Arietis	E.	58 32 26	2980	57 1 48	2997	55 31 31	3014	54 1 35	3032
	Aldebaran	E.	89 2 33	2772	87 27 28	2780	85 52 34	2789	84 17 52	2798
16	JUPITER	W.	105 31 38	2913	107 3 40	2921	108 35 32	2929	110 7 14	2937
	Antares	W.	102 51 46	2885	104 24 24	2894	105 56 51	2902	107 29 7	2910
	MARS	W.	86 6 30	3110	87 34 28	3118	89 2 16	3126	90 29 54	3134
	α Aquilæ	W.	59 23 57	3685	60 41 0	3668	61 58 21	3652	63 15 59	3638
	α Arietis	E.	46 37 48	3134	45 10 20	3159	43 43 22	3185	42 16 55	3214
	Aldebaran	E.	76 27 7	2839	74 53 30	2847	73 20 3	2855	71 46 46	2862
17	MARS	W.	97 45 40	3173	99 12 21	3181	100 38 53	3188	102 5 16	3195
	α Aquilæ	W.	69 47 20	3591	71 6 4	3586	72 24 54	3581	73 43 49	3578
	α Arietis	E.	35 13 58	3396	33 51 37	3445	32 30 11	3498	31 9 45	3559
	Aldebaran	E.	64 2 49	2900	62 30 30	2907	60 58 20	2913	59 26 18	2920
18	α Aquilæ	W.	80 18 59	3574	81 38 2	3575	82 57 4	3576	84 16 4	3579
	Fomalhaut	W.	45 32 10	3396	46 54 31	3380	48 17 10	3366	49 40 5	3355
	Aldebaran	E.	51 48 19	2954	50 17 8	2960	48 46 5	2966	47 15 10	2973
	Pollux	E.	95 59 29	2983	94 28 55	2989	92 58 29	2995	91 28 10	3001
19	α Aquilæ	W.	90 50 2	3604	92 8 32	3610	93 26 55	3617	94 45 11	3624
	Fomalhaut	W.	56 37 32	3314	58 1 27	3310	59 25 27	3306	60 49 32	3301
	α Pegasi	W.	43 20 49	3869	44 34 40	3829	45 49 12	3792	47 4 22	3760
	Aldebaran	E.	39 42 29	3002	38 12 19	3008	36 42 16	3014	35 12 20	3018
	Pollux	E.	83 58 25	3030	82 28 49	3035	80 59 20	3041	79 29 58	3046
20	Fomalhaut	W.	67 50 49	3291	69 15 11	3290	70 39 34	3289	72 3 58	3289
	α Pegasi	W.	53 27 39	3640	54 45 30	3623	56 3 40	3607	57 22 7	3592
	Aldebaran	E.	27 44 20	3046	26 15 4	3051	24 45 54	3056	23 16 51	3061
	Pollux	E.	72 4 42	3071	70 35 57	3076	69 7 18	3081	67 38 45	3086
21	Fomalhaut	W.	79 5 57	3290	80 30 20	3291	81 54 42	3292	83 19 3	3292
	α Pegasi	W.	63 57 55	3536	65 17 39	3528	66 37 32	3520	67 57 34	3513
	Pollux	E.	60 17 22	3107	58 49 21	3110	57 21 24	3114	55 53 32	3119
	SATURN	E.	86 40 39	3090	85 12 17	3092	83 43 58	3095	82 15 42	3096
	Regulus	E.	95 58 37	3067	94 29 47	3069	93 1 0	3072	91 32 16	3074

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	III^h	P. L. of Diff.	VI^h.	P. L. of Diff.	IX^h.	P. L. of Diff.
22	Fomalhaut	W.	84° 43′ 24″	3293	86° 7′ 44″	3294	87° 32′ 2″	3295	88° 56′ 19″	3296
	α Pegasi	W.	69 17 44	3506	70 38 1	3501	71 58 24	3495	73 18 54	3490
	α Arietis	W.	26 12 38	3924	27 25 33	3844	28 39 50	3775	29 55 18	3716
	Pollux	E.	54 25 45	3123	52 58 3	3126	51 30 25	3129	50 2 51	3133
	Saturn	E.	80 47 28	3099	79 19 17	3101	77 51 8	3102	76 23 1	3103
	Regulus	E.	90 3 35	3076	88 34 56	3078	87 6 19	3079	85 37 44	3081
23	Fomalhaut	W.	95 57 27	3301	97 21 37	3301	98 45 47	3302	100 9 56	3304
	α Pegasi	W.	80 2 40	3469	81 23 39	3466	82 44 41	3463	84 5 47	3459
	α Arietis	W.	36 25 54	3514	37 46 3	3485	39 6 44	3460	40 27 53	3436
	Pollux	E.	42 46 7	3151	41 18 59	3155	39 51 56	3158	38 24 57	3163
	Saturn	E.	69 2 39	3105	67 34 35	3104	66 6 30	3104	64 38 25	3103
	Regulus	E.	78 15 6	3082	76 46 35	3082	75 18 3	3082	73 49 31	3081
24	α Arietis	W.	47 19 40	3342	48 43 3	3327	50 6 43	3313	51 30 40	3298
	Pollux	E.	31 11 33	3193	29 45 15	3202	28 19 8	3212	26 53 13	3224
	Saturn	E.	57 17 29	3091	55 49 9	3088	54 20 45	3084	52 52 16	3080
	Regulus	E.	66 26 23	3070	64 57 37	3067	63 28 47	3064	61 59 53	3060
	Sun	E.	129 34 31	3477	128 13 41	3472	126 52 46	3468	125 31 46	3463
25	α Arietis	W.	58 34 25	3233	59 59 55	3221	61 25 39	3209	62 51 38	3196
	Aldebaran	W.	25 43 6	3040	27 12 29	3033	28 42 1	3026	30 11 42	3018
	Saturn	E.	45 28 30	3055	43 59 25	3048	42 30 12	3042	41 0 51	3035
	Regulus	E.	54 34 2	3035	53 4 33	3029	51 34 56	3022	50 5 11	3015
	Sun	E.	118 45 11	3431	117 23 30	3423	116 1 40	3415	114 39 41	3408
26	α Arietis	W.	70 5 13	3135	71 32 40	3122	73 0 23	3109	74 28 22	3096
	Aldebaran	W.	37 42 44	2973	39 13 31	2962	40 44 31	2952	42 15 44	2942
	Saturn	E.	33 31 44	2993	32 1 22	2983	30 30 48	2973	29 0 2	2964
	Regulus	E.	42 34 7	2975	41 3 23	2966	39 32 28	2957	38 1 21	2946
	Sun	E.	107 47 20	3360	106 24 18	3350	105 1 4	3338	103 37 37	3326
27	α Arietis	W.	81 52 15	3030	83 21 51	3015	84 51 45	3001	86 21 57	2987
	Aldebaran	W.	49 55 23	2861	51 28 6	2869	53 1 5	2855	54 34 22	2841
	Regulus	E.	30 22 28	2892	28 49 59	2881	27 17 16	2869	25 44 18	2858
	Sun	E.	96 36 47	3262	95 11 51	3247	93 46 38	3232	92 21 7	3218
28	Aldebaran	W.	62 25 28	2766	64 0 41	2750	65 36 15	2734	67 12 10	2716
	Pollux	W.	19 22 49	3048	20 52 2	2993	22 22 23	2946	23 53 44	2904
	Sun	E.	85 8 58	3137	83 41 33	3119	82 13 47	3101	80 45 39	3084
29	Aldebaran	W.	75 17 31	2629	76 55 46	2611	78 34 26	2593	80 13 31	2574
	Pollux	W.	31 42 29	2739	33 18 17	2712	34 54 41	2685	36 31 41	2659
	Sun	E.	73 19 27	2990	71 49 2	2971	70 18 13	2952	68 47 0	2932
30	Aldebaran	W.	88 35 26	2480	90 17 8	2460	91 59 17	2441	93 41 53	2422
	Pollux	W.	44 45 5	2540	46 25 22	2517	48 6 11	2195	49 47 31	2473
	Sun	E.	61 4 35	2832	59 30 49	2812	57 56 37	2792	56 21 59	2773
31	Pollux	W.	58 21 47	2368	60 6 7	2348	61 50 56	2329	63 36 13	2310
	Regulus	W.	22 17 19	2349	24 2 7	2328	25 47 26	2307	27 33 16	2286
	Sun	E.	48 22 23	2676	46 45 11	2658	45 7 35	2640	43 29 35	2623

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^h.	P. L. of Diff.	XVIII^h.	P. L. of Diff.	XXI^h.	P. L. of Diff.
22	Fomalhaut	W.	90° 20′ 35″	3297	91° 44′ 50″	3298	93° 9′ 4	3300	94° 33′ 16″	3300
	α Pegasi	W.	74 39 29	3486	76 0 9	3480	77 20 55	3477	78 41 45	3472
	α Arietis	W.	31 11 48	3665	32 29 12	3621	33 47 24	3580	35 6 20	3545
	Pollux	E.	48 35 22	3137	47 7 57	3140	45 40 36	3143	44 13 19	3148
	SATURN	E.	74 54 55	3104	73 26 50	3105	71 58 46	3105	70 30 42	3105
	Regulus	E.	84 9 11	3082	82 40 39	3082	81 12 8	3082	79 43 37	3082
23	Fomalhaut	W.	101 34 3	3305	102 58 9	3306	104 22 14	3306	105 46 18	3307
	α Pegasi	W.	85 26 57	3456	86 48 10	3454	88 9 26	3451	89 30 45	3447
	α Arietis	W.	41 49 29	3415	43 11 29	3394	44 33 52	3376	45 56 36	3358
	Pollux	E.	36 58 4	3168	35 31 17	3173	34 4 35	3178	32 38 0	3185
	SATURN	E.	63 10 19	3101	61 42 11	3099	60 14 0	3096	58 45 46	3094
	Regulus	E.	72 20 58	3079	70 52 23	3078	69 23 46	3075	67 55 6	3073
24	α Arietis	W.	52 54 54	3284	54 19 24	3271	55 44 9	3259	57 9 9	3245
	Pollux	E.	25 27 32	3240	24 2 10	3259	22 37 10	3281	21 12 36	3309
	SATURN	E.	51 23 42	3076	49 55 3	3071	48 26 18	3066	46 57 27	3061
	Regulus	E.	60 30 54	3056	59 1 50	3051	57 32 40	3046	56 3 24	3041
	SUN	E.	124 10 40	3457	122 49 28	3452	121 28 10	3445	120 6 44	3438
25	α Arietis	W.	64 17 52	3184	65 44 20	3172	67 11 3	3159	68 38 1	3148
	Aldebaran	W.	31 41 33	3009	33 11 34	3001	34 41 46	2992	36 12 9	2982
	SATURN	E.	39 31 22	3027	38 1 43	3019	36 31 54	3011	35 1 55	3001
	Regulus	E.	48 35 17	3008	47 5 14	3001	45 35 2	2993	44 4 40	2984
	SUN	E.	113 17 34	3400	111 55 17	3390	110 32 49	3380	109 10 10	3371
26	α Arietis	W.	75 56 36	3083	77 25 6	3069	78 53 53	3056	80 22 56	3043
	Aldebaran	W.	43 47 10	2931	45 18 50	2919	46 50 45	2906	48 22 56	2894
	SATURN	E.	27 29 4	2953	25 57 52	2942	24 26 26	2931	22 54 46	2920
	Regulus	E.	36 30 1	2936	34 58 28	2926	33 26 42	2915	31 54 42	2904
	SUN	E.	102 13 56	3314	100 50 1	3302	99 25 52	3288	98 1 27	3276
27	α Arietis	W.	87 52 26	2973	89 23 13	2958	90 54 19	2943	92 25 43	2927
	Aldebaran	W.	56 7 57	2826	57 41 51	2811	59 16 4	2797	60 50 36	2782
	Regulus	E.	24 11 5	2846	22 37 37	2835	21 3 54	2824	19 29 57	2814
	SUN	E.	90 55 19	3203	89 29 13	3187	88 2 48	3170	86 36 3	3153
28	Aldebaran	W.	68 48 28	2699	70 25 9	2682	72 2 13	2665	73 39 40	2647
	Pollux	W.	25 25 58	2866	26 59 1	2831	28 32 49	2798	30 7 19	2768
	SUN	E.	79 17 10	3066	77 48 19	3047	76 19 5	3029	74 49 28	3009
29	Aldebaran	W.	81 53 2	2555	83 32 59	2536	85 13 22	2517	86 54 11	2499
	Pollux	W.	38 9 16	2635	39 47 24	2610	41 26 5	2586	43 5 19	2563
	SUN	E.	67 15 22	2912	65 43 19	2892	64 10 50	2872	62 37 55	2852
30	Aldebaran	W.	95 24 56	2403	97 8 26	2384	98 52 23	2365	100 36 48	2346
	Pollux	W.	51 29 22	2451	53 11 44	2430	54 54 36	2410	56 37 57	2389
	SUN	E.	54 46 56	2753	53 11 26	2734	51 35 31	2714	49 59 10	2695
31	Pollux	W.	65 21 58	2291	67 8 11	2272	68 54 51	2254	70 41 58	2237
	Regulus	W.	29 19 36	2267	31 6 24	2248	32 53 40	2230	34 41 23	2212
	SUN	E.	41 51 11	2606	40 12 24	2590	38 33 15	2574	36 53 44	2559

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.	Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Subtracted from Apparent Time.	Diff. for 1 Hour.
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Thur.	1	14 28 25.46	9.824	S. 14 39 59.9	−47.71	16 9.98	67.02	16 20.43	0.031
Frid.	2	14 32 21.66	9.859	14 58 58.0	47.12	16 10.22	67.14	16 20.78	0.003
Sat.	3	14 36 18.68	9.893	15 17 41.4	46.50	16 10.46	67.26	16 20.31	0.037
SUN.	4	14 40 16.52	9.928	15 36 9.8	−45.86	16 10.70	67.38	16 19.02	0.072
Mon.	5	14 44 15.20	9.962	15 54 22.7	45.21	16 10.94	67.49	16 16.91	0.106
Tues.	6	14 48 14.71	9.997	16 12 19.7	44.54	16 11.18	67.61	16 13.97	0.141
Wed.	7	14 52 15.05	10.031	16 30 0.4	−43.84	16 11.42	67.73	16 10.20	0.175
Thur.	8	14 56 16.22	10.066	16 47 24.4	43.14	16 11.66	67.85	16 5.59	0.210
Frid.	9	15 0 18.23	10.100	17 4 31.2	42.42	16 11.90	67.97	16 0.15	0.244
Sat.	10	15 4 21.06	10.135	17 21 20.5	−41.68	16 12.13	68.09	15 53.89	0.279
SUN.	11	15 8 24.73	10.170	17 37 51.8	40.92	16 12.36	68.21	15 46.79	0.314
Mon.	12	15 12 29.24	10.206	17 54 4.6	40.14	16 12.58	68.33	15 38.86	0.349
Tues.	13	15 16 34.58	10.240	18 9 58.6	−39.35	16 12.80	68.45	15 30.10	0.383
Wed.	14	15 20 40.75	10.275	18 25 33.5	38.54	16 13.02	68.57	15 20.51	0.418
Thur.	15	15 24 47.75	10.309	18 40 48.9	37.72	16 13.24	68.69	15 10.10	0.452
Frid.	16	15 28 55.57	10.344	18 55 44.3	−36.88	16 13.45	68.81	14 58.86	0.487
Sat.	17	15 33 4.23	10.378	19 10 19.3	36.03	16 13.66	68.93	14 46.79	0.521
SUN.	18	15 37 13.72	10.413	19 24 33.6	35.16	16 13.86	69.04	14 33.89	0.556
Mon.	19	15 41 24.03	10.447	19 38 27.0	−34.28	16 14.06	69.15	14 20.17	0.590
Tues.	20	15 45 35.16	10.481	19 51 59.1	33.38	16 14.25	69.26	14 5.64	0.624
Wed.	21	15 49 47.11	10.515	20 5 9.4	32.46	16 14.44	69.37	13 50.29	0.658
Thur.	22	15 53 59.87	10.548	20 17 57.5	−31.53	16 14.62	69.48	13 34.14	0.691
Frid.	23	15 58 13.42	10.581	20 30 23.2	30.59	16 14.80	69.59	13 17.18	0.724
Sat.	24	16 2 27.76	10.614	20 42 26.2	29.64	16 14.97	69.70	12 59.43	0.757
SUN.	25	16 6 42.89	10.647	20 54 6.2	−28.67	16 15.14	69.80	12 40.91	0.789
Mon.	26	16 10 58.78	10.678	21 5 22.8	27.69	16 15.30	69.90	12 21.63	0.820
Tues.	27	16 15 15.42	10.708	21 16 15.6	26.70	16 15.46	69.99	12 1.60	0.850
Wed.	28	16 19 32.79	10.738	21 26 44.3	−25.69	16 15.62	70.09	11 40.85	0.880
Thur.	29	16 23 50.87	10.767	21 36 48.6	24.67	16 15.78	70.18	11 19.39	0.909
Frid.	30	16 28 9.63	10.795	21 46 28.3	23.63	16 15.93	70.27	10 57.25	0.937
Sat.	31	16 32 29.06	10.822	S. 21 55 43.0	−22.58	16 16.08	70.36	10 34.44	0.964

NOTE.—The mean time of semidiameter passing may be found by subtracting 0s.19 from the sidereal time.
The sign — prefixed to the hourly change of declination indicates that south declinations are increasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	Diff. for 1 Hour.	THE SUN'S Apparent Declination.	Diff. for 1 Hour.	Equation of Time, to be Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	m s	s	h m s
Thur.	1	14 28 28.13	9.825	S. 14 40 12.9	−47.71	16 20.44	0.031	14 44 48.56
Frid.	2	14 32 24.34	9.859	14 59 10.8	47.11	16 20.78	0.003	14 48 45.12
Sat.	3	14 36 21.37	9.893	15 17 54.1	46.49	16 20.30	0.037	14 52 41.67
SUN.	4	14 40 19.22	9.928	15 36 22.3	−45.85	16 19.00	0.072	14 56 38.23
Mon.	5	14 44 17.90	9.962	15 54 35.0	45.20	16 16.88	0.106	15 0 34.78
Tues.	6	14 48 17.41	9.997	16 12 31.8	44.53	16 13.93	0.141	15 4 31.34
Wed.	7	14 52 17.75	10.031	16 30 12.3	−43.83	16 10.14	0.175	15 8 27.89
Thur.	8	14 56 18.92	10.066	16 47 36.0	43.13	16 5.53	0.210	15 12 24.45
Frid.	9	15 0 20.92	10.100	17 4 42.6	42.41	16 0.09	0.244	15 16 21.00
Sat.	10	15 4 23.74	10.135	17 21 31.6	−41.67	15 53.82	0.279	15 20 17.56
SUN.	11	15 8 27.40	10.170	17 38 2.6	40.91	15 46.71	0.314	15 24 14.11
Mon.	12	15 12 31.89	10.205	17 54 15.1	40.13	15 38.77	0.349	15 28 10.67
Tues.	13	15 16 37.22	10.239	18 10 8.8	−39.34	15 30.00	0.383	15 32 7.22
Wed.	14	15 20 43.37	10.274	18 25 43.4	38.53	15 20.41	0.418	15 36 3.78
Thur.	15	15 24 50.35	10.308	18 40 58.4	37.71	15 9.99	0.452	15 40 0.33
Frid.	16	15 28 58.15	10.343	18 55 53.5	−36.87	14 58.74	0.487	15 43 56.89
Sat.	17	15 33 6.78	10.377	19 10 28.2	36.02	14 46.66	0.521	15 47 53.44
SUN.	18	15 37 16.24	10.412	19 24 42.2	35.15	14 33.76	0.556	15 51 50.00
Mon.	19	15 41 26.52	10.446	19 38 35.2	−34.27	14 20.03	0.590	15 55 46.55
Tues.	20	15 45 37.62	10.480	19 52 6.9	33.37	14 5.49	0.624	15 59 43.11
Wed.	21	15 49 49.53	10.514	20 5 16.8	32.45	13 50.14	0.658	16 3 39.66
Thur.	22	15 54 2.25	10.547	20 18 4.6	−31.52	13 33.98	0.691	16 7 36.22
Frid.	23	15 58 15.76	10.580	20 30 30.0	30.58	13 17.02	0.724	16 11 32.78
Sat.	24	16 2 30.06	10.613	20 42 32.7	29.63	12 59.27	0.757	16 15 29.34
SUN.	25	16 6 45.14	10.645	20 54 12.3	−28.66	12 40.75	0.789	16 19 25.89
Mon.	26	16 11 0.98	10.676	21 5 28.5	27.68	12 21.47	0.820	16 23 22.45
Tues.	27	16 15 17.57	10.706	21 16 20.9	26.69	12 1.44	0.850	16 27 19.01
Wed.	28	16 19 34.88	10.736	21 26 49.3	−25.68	11 40.69	0.880	16 31 15.57
Thur.	29	16 23 52.90	10.765	21 36 53.3	24.66	11 19.23	0.909	16 35 12.12
Frid.	30	16 28 11.60	10.793	21 46 32.6	23.62	10 57.08	0.937	16 39 8.68
Sat.	31	16 32 30.97	10.820	S. 21 55 47.0	−22.57	10 34.27	0.964	16 43 5.24

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign — prefixed to the hourly change of declination indicates that south declinations are increasing.

Diff. for 1 hour, +9s.8565. (Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S TRUE LONGITUDE. λ	THE SUN'S TRUE LONGITUDE. λ'	Diff. for 1 Hour.	THE SUN'S LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
								h m s
1	306	219° 31′ 31″.1	31′ 6″.2	150″.34	+ 0″.60	9.9964159	−45.7	9 13 40.48
2	307	220 31 40.3	31 15.3	150.42	0.62	9.9963065	45.5	9 9 44.57
3	308	221 31 51.4	31 26.3	150.49	0.60	9.9961975	45.3	9 5 48.66
4	309	222 32 4.4	31 39.2	150.56	+ 0.57	9.9960890	−45.1	9 1 52.75
5	310	223 32 19.2	31 53.9	150.63	0.50	9.9959810	44.9	8 57 56.84
6	311	224 32 35.7	32 10.2	150.71	0.40	9.9958736	44.6	8 54 0.93
7	312	225 32 53.8	32 28.2	150.78	+ 0.29	9.9957668	−44.3	8 50 5.03
8	313	226 33 13.4	32 47.7	150.85	0.17	9.9956608	44.0	8 46 9.12
9	314	227 33 34.6	33 8.8	150.91	+ 0.04	9.9955558	43.6	8 42 13.21
10	315	228 33 57.2	33 31.2	150.97	− 0.10	9.9954519	−43.1	8 38 17.30
11	316	229 34 21.1	33 54.9	151.03	0.22	9.9953491	42.5	8 34 21.39
12	317	230 34 46.3	34 20.0	151.08	0.32	9.9952477	41.9	8 30 25.48
13	318	231 35 12.9	34 46.5	151.14	− 0.41	9.9951479	−41.2	8 26 29.57
14	319	232 35 40.9	35 14.4	151.19	0.47	9.9950498	40.5	8 22 33.66
15	320	233 36 10.3	35 43.6	151.25	0.50	9.9949536	39.7	8 18 37.75
16	321	234 36 41.0	36 14.1	151.31	− 0.50	9.9948593	−38.8	8 14 41.84
17	322	235 37 13.1	36 46.1	151.37	0.47	9.9947672	37.9	8 10 45.93
18	323	236 37 46.7	37 19.5	151.42	0.41	9.9946772	37.0	8 6 50.02
19	324	237 38 21.7	37 54.4	151.48	− 0.33	9.9945893	−36.1	8 2 54.11
20	325	238 38 58.2	38 30.7	151.55	0.23	9.9945037	35.2	7 58 58.20
21	326	239 39 36.2	39 8.5	151.61	− 0.11	9.9944202	34.3	7 55 2.29
22	327	240 40 15.8	39 48.0	151.68	+ 0.02	9.9943390	−33.4	7 51 6.38
23	328	241 40 57.0	40 29.1	151.75	0.16	9.9942599	32.5	7 47 10.47
24	329	242 41 39.8	41 11.7	151.82	0.29	9.9941828	31.7	7 43 14.56
25	330	243 42 24.2	41 55.9	151.89	+ 0.41	9.9941077	−30.9	7 39 18.65
26	331	244 43 10.2	42 41.7	151.95	0.51	9.9940345	30.2	7 35 22.74
27	332	245 43 57.8	43 29.2	152.02	0.59	9.9939630	29.5	7 31 26.82
28	333	246 44 46.9	44 18.2	152.08	+ 0.64	9.9938932	−28.8	7 27 30.91
29	334	247 45 37.4	45 8.5	152.14	0.66	9.9938249	28.2	7 23 35.00
30	335	248 46 29.3	46 0.2	152.19	0.65	9.9937580	27.6	7 19 39.09
31	336	249 47 22.6	46 53.3	152.24	+ 0.61	9.9936925	−27.0	7 15 43.18

NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ', to the mean equinox of January $0^d.0$.

Diff. for 1 Hour, $-9^s.8296$. (Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER. Noon.	SEMIDIAMETER. Midnight.	HORIZONTAL PARALLAX. Noon.	Diff. for 1 Hour.	HORIZONTAL PARALLAX. Midnight.	Diff. for 1 Hour.	UPPER TRANSIT. Meridian of Greenwich.	Diff. for 1 Hour.	AGE. Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	16 20.1	16 26.8	59 50.5	+2.12	60 14.8	+1.90	22 26.8	2.22	26.9
2	16 32.6	16 37.4	60 36.1	1.63	60 53.8	1.30	23 21.1	2.31	27.9
3	16 41.0	16 43.4	61 7.2	0.92	61 15.9	+0.52	6		28.9
4	16 44.4	16 44 1	61 19.7	+0.10	61 18.4	−0.31	0 17.9	2.42	0.5
5	16 42.4	16 39.5	61 12.2	−0.71	61 1.4	1.08	1 17.2	2.52	1.5
6	16 35.4	16 30.3	60 46.4	1.40	60 27.8	1.68	2 18.3	2.57	2.5
7	16 24.4	16 17.9	60 6.2	−1.89	59 42.4	−2.05	3 19.9	2.55	3.5
8	16 11.0	16 3.8	59 17.0	2.16	58 50.6	2.22	4 20.0	2.45	4.5
9	15 56.5	15 49.3	58 23.8	2.23	57 57.2	2.19	5 17.1	2.30	5.5
10	15 42.2	15 35.4	57 31.3	−2.12	57 6.3	−2.03	6 10.5	2.14	6.5
11	15 29.0	15 22.9	56 42.6	1.91	56 20.4	1.79	7 0.1	2.00	7.5
12	15 17.3	15 12.1	55 59.7	1.65	55 40.7	1.51	7 46.7	1.88	8.5
13	15 7.5	15 3.2	55 23.5	−1.36	55 8.0	−1.22	8 30.8	1.80	9.5
14	14 59.5	14 56.2	54 54.2	1.08	54 42.0	0.95	9 13.6	1.76	10.5
15	14 53.3	14 50.8	54 31.4	0.82	54 22.3	0.70	9 55.7	1.75	11.5
16	14 48.7	14 47.0	54 14.7	−0.58	54 8.5	−0.46	10 38.0	1.78	12.5
17	14 45.7	14 44.7	54 3.6	0.35	54 0.0	0.25	11 21.1	1.82	13.5
18	14 44.1	14 43.8	53 57.7	−0.14	53 56.6	−0.04	12 5.5	1.88	14.5
19	14 43.8	14 44.2	53 56.8	+0.07	53 58.3	+0.18	12 51.5	1.95	15.5
20	14 45.0	14 46.2	54 1.2	0.30	54 5.5	0.42	13 39.1	2.01	16.5
21	14 47.8	14 49.8	54 11.3	0.55	54 18.7	0.69	14 27.9	2.05	17.5
22	14 52.3	14 55.2	54 27.8	+0.83	54 38.6	+0.98	15 17.4	2.07	18.5
23	14 58.7	15 2.6	54 51.2	1.13	55 5.7	1.29	16 7.0	2.07	19.5
24	15 7.1	15 12.1	55 22.2	1.45	55 40.6	1.61	16 56.5	2.05	20.5
25	15 17.6	15 23.7	56 0.9	+1.77	56 23.0	+1.92	17 45.4	2.03	21.5
26	15 30.2	15 37.1	56 46.9	2.06	57 12.4	2.18	18 34.0	2.03	22.5
27	15 44.4	15 51.9	57 39.1	2.26	58 6.7	2.32	19 22.9	2.05	23.5
28	15 59.5	16 7.2	58 34.8	+2.34	59 2.8	+2.31	20 12.6	2.10	24.5
29	16 14.6	16 21.7	59 30.2	2.23	59 56.2	2.09	21 4.1	2.20	25.5
30	16 28.3	16 34.1	60 20.3	1.89	60 41.6	1.63	21 58.4	2.33	26.5
31	16 38.9	16 42.6	60 59.3	+1.31	61 13.0	+0.95	22 55.9	2.47	27.5

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	THURSDAY 1.			
	h m s	s	° ′ ″	″
0	12 24 16.17	2.2453	N. 2 31 28.3	13.377
1	12 26 30.95	2.2474	2 18 4.7	13.408
2	12 28 45.86	2.2496	2 4 39.3	13.437
3	12 31 0.90	2.2517	1 51 12.2	13.466
4	12 33 16.07	2.2539	1 37 43.4	13.493
5	12 35 31.37	2.2562	1 24 13.0	13.519
6	12 37 46.81	2.2585	1 10 41.1	13.543
7	12 40 2.39	2.2608	0 57 7.8	13.566
8	12 42 18.11	2.2632	0 43 33.2	13.587
9	12 44 33.97	2.2656	0 29 57.4	13.607
10	12 46 49.98	2.2681	0 16 20.4	13.625
11	12 49 6.14	2.2707	N. 0 2 42.4	13.642
12	12 51 22.46	2.2732	S. 0 10 56.6	13.657
13	12 53 38.93	2.2758	0 24 36.5	13.671
14	12 55 55.56	2.2785	0 38 17.1	13.682
15	12 58 12.35	2.2812	0 51 58.4	13.693
16	13 0 29.30	2.2839	1 5 40.3	13.703
17	13 2 46.42	2.2867	1 19 22.8	13.712
18	13 5 3.71	2.2896	1 33 5.7	13.718
19	13 7 21.17	2.2924	1 46 48.9	13.722
20	13 9 38.80	2.2953	2 0 32.3	13.724
21	13 11 56.61	2.2983	2 14 15.8	13.726
22	13 14 14.60	2.3013	2 27 59.4	13.726
23	13 16 32.77	2.3044	S. 2 41 42.9	13.723
	FRIDAY 2.			
0	13 18 51.13	2.3075	S. 2 55 26.2	13.720
1	13 21 9.67	2.3106	3 9 9.3	13.715
2	13 23 28.40	2.3138	3 22 52.0	13.708
3	13 25 47.33	2.3171	3 36 34.2	13.699
4	13 28 6.45	2.3203	3 50 15.9	13.689
5	13 30 25.77	2.3236	4 3 56.9	13.677
6	13 32 45.28	2.3268	4 17 37.1	13.663
7	13 35 4.99	2.3302	4 31 16.5	13.648
8	13 37 24.91	2.3337	4 44 54.9	13.631
9	13 39 45.04	2.3372	4 58 32.2	13.613
10	13 42 5.37	2.3406	5 12 8.4	13.593
11	13 44 25.91	2.3441	5 25 43.3	13.570
12	13 46 46.67	2.3477	5 39 16.8	13.546
13	13 49 7.64	2.3513	5 52 48.8	13.520
14	13 51 28.83	2.3549	6 6 19.2	13.492
15	13 53 50.23	2.3585	6 19 47.9	13.463
16	13 56 11.85	2.3622	6 33 14.8	13.432
17	13 58 33.70	2.3660	6 46 39.8	13.400
18	14 0 55.77	2.3697	7 0 2.8	13.365
19	14 3 18.07	2.3735	7 13 23.6	13.328
20	14 5 40.59	2.3773	7 26 42.2	13.291
21	14 8 3.34	2.3811	7 39 58.5	13.251
22	14 10 26.32	2.3850	7 53 12.3	13.208
23	14 12 49.54	2.3889	8 6 23.5	13.165
24	14 15 12.99	2.3928	S. 8 19 32.1	13.120

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY 3.			
	h m s	s	° ′ ″	″
0	14 15 12.99	2.3928	S. 8 19 32.1	13.120
1	14 17 36.67	2.3967	8 32 37.9	13.072
2	14 20 0.59	2.4007	8 45 40.8	13.023
3	14 22 24.75	2.4047	8 58 40.7	12.972
4	14 24 49.15	2.4087	9 11 37.5	12.919
5	14 27 13.79	2.4126	9 24 31.0	12.864
6	14 29 38.66	2.4166	9 37 21.2	12.807
7	14 32 3.78	2.4207	9 50 7.9	12.749
8	14 34 29.14	2.4247	10 2 51.1	12.690
9	14 36 54.74	2.4287	10 15 30.7	12.628
10	14 39 20.59	2.4328	10 28 6.5	12.564
11	14 41 46.68	2.4368	10 40 38.4	12.498
12	14 44 13.01	2.4409	10 53 6.3	12.431
13	14 46 39.59	2.4450	11 5 30.1	12.362
14	14 49 6.41	2.4491	11 17 49.7	12.291
15	14 51 33.48	2.4532	11 30 5.0	12.217
16	14 54 0.79	2.4573	11 42 15.8	12.143
17	14 56 28.35	2.4614	11 54 22.1	12.067
18	14 58 56.16	2.4655	12 6 23.8	11.988
19	15 1 24.21	2.4695	12 18 20.7	11.907
20	15 3 52.50	2.4736	12 30 12.7	11.826
21	15 6 21.04	2.4777	12 41 59.8	11.743
22	15 8 49.82	2.4817	12 53 41.9	11.657
23	15 11 18.84	2.4857	S. 13 5 18.7	11.569
	SUNDAY 4.			
0	15 13 48.11	2.4898	S. 13 16 50.2	11.480
1	15 16 17.62	2.4938	13 28 16.3	11.390
2	15 18 47.37	2.4977	13 39 37.0	11.298
3	15 21 17.35	2.5017	13 50 52.1	11.204
4	15 23 47.57	2.5057	14 2 1.5	11.108
5	15 26 18.03	2.5096	14 13 5.1	11.010
6	15 28 48.72	2.5134	14 24 2.7	10.910
7	15 31 19.64	2.5173	14 34 54.3	10.810
8	15 33 50.79	2.5212	14 45 39.9	10.707
9	15 36 22.18	2.5250	14 56 19.2	10.602
10	15 38 53.79	2.5287	15 6 52.2	10.497
11	15 41 25.63	2.5325	15 17 18.9	10.391
12	15 43 57.69	2.5362	15 27 39.1	10.282
13	15 46 29.97	2.5398	15 37 52.7	10.171
14	15 49 2.47	2.5434	15 47 59.6	10.058
15	15 51 35.18	2.5470	15 57 59.7	9.944
16	15 54 8.11	2.5506	16 7 52.9	9.829
17	15 56 41.25	2.5540	16 17 39.2	9.712
18	15 59 14.59	2.5573	16 27 18.4	9.593
19	16 1 48.13	2.5607	16 36 50.4	9.474
20	16 4 21.87	2.5640	16 46 15.3	9.354
21	16 6 55.81	2.5672	16 55 32.9	9.232
22	16 9 29.94	2.5704	17 4 43.1	9.108
23	16 12 4.26	2.5736	17 13 45.8	8.982
24	16 14 38.77	2.5767	S. 17 22 40.9	8.855

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	MONDAY 5.			
	h m s	s	° ′ ″	″
0	16 14 38.77	2.5767	S. 17 22 40.9	8.855
1	16 17 13.46	2.5797	17 31 28.4	8.727
2	16 19 48.33	2.5826	17 40 8.2	8.598
3	16 22 23.37	2.5854	17 48 40.2	8.467
4	16 24 58.58	2.5882	17 57 4.3	8.335
5	16 27 33.95	2.5909	18 5 20.4	8.202
6	16 30 9.48	2.5935	18 13 28.5	8.068
7	16 32 45.17	2.5960	18 21 28.6	7.933
8	16 35 21.00	2.5984	18 29 20.5	7.797
9	16 37 56.98	2.6008	18 37 4.2	7.659
10	16 40 33.10	2.6032	18 44 39.6	7.520
11	16 43 9.36	2.6054	18 52 6.6	7.380
12	16 45 45.75	2.6076	18 59 25.2	7.239
13	16 48 22.27	2.6096	19 6 35.3	7.097
14	16 50 58.90	2.6114	19 13 36.9	6.955
15	16 53 35.64	2.6133	19 20 29.9	6.812
16	16 56 12.49	2.6151	19 27 14.3	6.667
17	16 58 49.45	2.6167	19 33 50.0	6.522
18	17 1 26.50	2.6182	19 40 16.9	6.375
19	17 4 3.64	2.6197	19 46 35.0	6.228
20	17 6 40.87	2.6211	19 52 44.3	6.081
21	17 9 18.17	2.6223	19 58 44.8	5.933
22	17 11 55.54	2.6234	20 4 36.3	5.783
23	17 14 32.98	2.6246	S. 20 10 18.8	5.632
	TUESDAY 6.			
0	17 17 10.49	2.6256	S. 20 15 52.2	5.482
1	17 19 48.05	2.6264	20 21 16.6	5.331
2	17 22 25.65	2.6270	20 26 31.9	5.180
3	17 25 3.29	2.6276	20 31 38.2	5.028
4	17 27 40.96	2.6281	20 36 35.3	4.875
5	17 30 18.66	2.6285	20 41 23.2	4.722
6	17 32 56.38	2.6287	20 46 1.9	4.568
7	17 35 34.11	2.6289	20 50 31.3	4.414
8	17 38 11.85	2.6290	20 54 51.5	4.260
9	17 40 49.59	2.6289	20 59 2.5	4.106
10	17 43 27.32	2.6287	21 3 4.2	3.950
11	17 46 5.04	2.6284	21 6 56.5	3.794
12	17 48 42.73	2.6279	21 10 39.5	3.639
13	17 51 20.39	2.6274	21 14 13.2	3.483
14	17 53 58.02	2.6268	21 17 37.5	3.328
15	17 56 35.61	2.6261	21 20 52.5	3.172
16	17 59 13.15	2.6252	21 23 58.1	3.015
17	18 1 50.63	2.6241	21 26 54.3	2.859
18	18 4 28.04	2.6229	21 29 41.2	2.703
19	18 7 5.38	2.6217	21 32 18.7	2.547
20	18 9 42.65	2.6205	21 34 46.9	2.391
21	18 12 19.84	2.6191	21 37 5.7	2.235
22	18 14 56.94	2.6174	21 39 15.1	2.079
23	18 17 33.93	2.6156	21 41 15.2	1.924
24	18 20 10.81	2.6138	S. 21 43 6.0	1.768

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	WEDNESDAY 7.			
	h m s	s	° ′ ″	″
0	18 20 10.81	2.6138	S. 21 43 6.0	1.768
1	18 22 47.58	2.6119	21 44 47.4	1.613
2	18 25 24.24	2.6099	21 46 19.5	1.458
3	18 28 0.77	2.6077	21 47 42.4	1.304
4	18 30 37.16	2.6054	21 48 56.0	1.149
5	18 33 13.41	2.6030	21 50 0.3	0.994
6	18 35 49.52	2.6006	21 50 55.3	0.840
7	18 38 25.48	2.5979	21 51 41.1	0.687
8	18 41 1.27	2.5951	21 52 17.8	0.535
9	18 43 36.89	2.5923	21 52 45.3	0.382
10	18 46 12.34	2.5894	21 53 3.6	0.229
11	18 48 47.62	2.5864	21 53 12.8	− 0.078
12	18 51 22.71	2.5832	21 53 13.0	+ 0.073
13	18 53 57.61	2.5800	21 53 4.1	0.223
14	18 56 32.31	2.5766	21 52 46.2	0.372
15	18 59 6.80	2.5731	21 52 19.4	0.522
16	19 1 41.08	2.5696	21 51 43.6	0.671
17	19 4 15.15	2.5660	21 50 58.9	0.819
18	19 6 49.00	2.5622	21 50 5.3	0.966
19	19 9 22.62	2.5584	21 49 2.9	1.112
20	19 11 56.01	2.5544	21 47 51.8	1.258
21	19 14 29.15	2.5503	21 46 31.9	1.404
22	19 17 2.05	2.5462	21 45 3.3	1.548
23	19 19 34.70	2.5421	S. 21 43 26.1	1.691
	THURSDAY 8.			
0	19 22 7.10	2.5378	S. 21 41 40.4	1.834
1	19 24 39.24	2.5334	21 39 46.1	1.976
2	19 27 11.11	2.5289	21 37 43.3	2.117
3	19 29 42.71	2.5244	21 35 32.1	2.257
4	19 32 14.04	2.5198	21 33 12.5	2.396
5	19 34 45.09	2.5152	21 30 44.6	2.534
6	19 37 15.86	2.5104	21 28 8.4	2.672
7	19 39 46.34	2.5056	21 25 24.0	2.808
8	19 42 16.53	2.5007	21 22 31.4	2.944
9	19 44 46.42	2.4957	21 19 30.7	3.078
10	19 47 16.01	2.4907	21 16 22.0	3.211
11	19 49 45.30	2.4856	21 13 5.4	3.343
12	19 52 14.28	2.4804	21 9 40.9	3.474
13	19 54 42.95	2.4752	21 6 8.5	3.605
14	19 57 11.30	2.4699	21 2 28.3	3.734
15	19 59 39.33	2.4645	20 58 40.4	3.862
16	20 2 7.04	2.4592	20 54 44.8	3.990
17	20 4 34.43	2.4538	20 50 41.6	4.116
18	20 7 1.49	2.4483	20 46 30.9	4.241
19	20 9 28.22	2.4428	20 42 12.7	4.365
20	20 11 54.62	2.4372	20 37 47.1	4.487
21	20 14 20.68	2.4316	20 33 14.2	4.608
22	20 16 46.41	2.4259	20 28 34.1	4.729
23	20 19 11.79	2.4202	20 23 46.7	4.849
24	20 21 36.83	2.4145	S. 20 18 52.2	4.967

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

FRIDAY 9.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	20 21 36.83	2.4145	S. 20 18 52.2	4.967
1	20 24 1.53	2.4087	20 13 50.7	5.083
2	20 26 25.88	2.4029	20 8 42.2	5.199
3	20 28 49.88	2.3971	20 3 26.8	5.314
4	20 31 13.53	2.3912	19 58 4.5	5.428
5	20 33 36.83	2.3853	19 52 35.4	5.541
6	20 35 59.77	2.3794	19 46 59.6	5.652
7	20 38 22.36	2.3735	19 41 17.2	5.762
8	20 40 44.59	2.3676	19 35 28.2	5.870
9	20 43 6.47	2.3617	19 29 32.8	5.977
10	20 45 27.99	2.3557	19 23 31.0	6.083
11	20 47 49.15	2.3497	19 17 22.8	6.189
12	20 50 9.96	2.3438	19 11 8.3	6.293
13	20 52 30.41	2.3378	19 4 47.6	6.396
14	20 54 50.49	2.3317	18 58 20.8	6.497
15	20 57 10.21	2.3257	18 51 47.9	6.598
16	20 59 29.57	2.3197	18 45 9.0	6.697
17	21 1 48.57	2.3137	18 38 24.2	6.796
18	21 4 7.22	2.3077	18 31 33.5	6.893
19	21 6 25.50	2.3017	18 24 37.1	6.988
20	21 8 43.42	2.2957	18 17 35.0	7.083
21	21 11 0.98	2.2896	18 10 27.2	7.176
22	21 13 18.17	2.2836	18 3 13.9	7.268
23	21 15 35.01	2.2777	S. 17 55 55.1	7.359

SATURDAY 10.

0	21 17 51.49	2.2717	S. 17 48 30.8	7.449
1	21 20 7.61	2.2657	17 41 1.2	7.537
2	21 22 23.38	2.2598	17 33 26.3	7.625
3	21 24 38.79	2.2538	17 25 46.2	7.711
4	21 26 53.84	2.2479	17 18 1.0	7.795
5	21 29 8.54	2.2420	17 10 10.8	7.879
6	21 31 22.88	2.2361	17 2 15.6	7.962
7	21 33 36.87	2.2302	16 54 15.4	8.044
8	21 35 50.51	2.2244	16 46 10.3	8.124
9	21 38 3.80	2.2186	16 38 0.5	8.203
10	21 40 16.74	2.2128	16 29 46.0	8.281
11	21 42 29.33	2.2070	16 21 26.8	8.358
12	21 44 41.58	2.2013	16 13 3.0	8.434
13	21 46 53.49	2.1956	16 4 34.7	8.508
14	21 49 5.05	2.1899	15 56 2.0	8.582
15	21 51 16.27	2.1842	15 47 24.9	8.654
16	21 53 27.15	2.1786	15 38 43.5	8.725
17	21 55 37.70	2.1731	15 29 57.9	8.795
18	21 57 47.92	2.1676	15 21 8.1	8.864
19	21 59 57.81	2.1620	15 12 14.2	8.932
20	22 2 7.36	2.1564	15 3 16.2	8.999
21	22 4 16.58	2.1510	14 54 14.3	9.064
22	22 6 25.48	2.1456	14 45 8.5	9.129
23	22 8 34.05	2.1402	14 35 58.8	9.193
24	22 10 42.30	2.1349	S. 14 26 45.3	9.256

SUNDAY 11.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	22 10 42.30	2.1349	S. 14 26 45.3	9.256
1	22 12 50.24	2.1296	14 17 28.1	9.317
2	22 14 57.86	2.1243	14 8 7.2	9.377
3	22 17 5.16	2.1191	13 58 42.8	9.437
4	22 19 12.15	2.1140	13 49 14.8	9.495
5	22 21 18.84	2.1089	13 39 43.4	9.552
6	22 23 25.22	2.1038	13 30 8.6	9.608
7	22 25 31.30	2.0988	13 20 30.5	9.663
8	22 27 37.08	2.0938	13 10 49.1	9.718
9	22 29 42.56	2.0888	13 1 4.4	9.772
10	22 31 47.74	2.0839	12 51 16.5	9.824
11	22 33 52.63	2.0791	12 41 25.5	9.875
12	22 35 57.23	2.0743	12 31 31.5	9.924
13	22 38 1.55	2.0696	12 21 34.6	9.973
14	22 40 5.58	2.0648	12 11 34.7	10.022
15	22 42 9.33	2.0602	12 1 31.9	10.070
16	22 44 12.81	2.0557	11 51 26.3	10.116
17	22 46 16.02	2.0512	11 41 18.0	10.160
18	22 48 18.95	2.0466	11 31 7.1	10.204
19	22 50 21.61	2.0422	11 20 53.5	10.248
20	22 52 24.01	2.0378	11 10 37.3	10.291
21	22 54 26.15	2.0335	11 0 18.6	10.332
22	22 56 28.03	2.0292	10 49 57.5	10.372
23	22 58 29.66	2.0250	S. 10 39 33.9	10.412

MONDAY 12.

0	23 0 31.03	2.0208	S. 10 29 8.0	10.451
1	23 2 32.15	2.0167	10 18 39.8	10.489
2	23 4 33.03	2.0127	10 8 9.3	10.526
3	23 6 33.67	2.0087	9 57 36.7	10.562
4	23 8 34.07	2.0047	9 47 1.9	10.597
5	23 10 34.23	2.0008	9 36 25.0	10.632
6	23 12 34.16	1.9969	9 25 46.1	10.665
7	23 14 33.86	1.9931	9 15 5.2	10.697
8	23 16 33.33	1.9893	9 4 22.4	10.729
9	23 18 32.58	1.9857	8 53 37.7	10.760
10	23 20 31.61	1.9821	8 42 51.2	10.790
11	23 22 30.43	1.9786	8 32 2.9	10.819
12	23 24 29.04	1.9751	8 21 12.9	10.847
13	23 26 27.44	1.9716	8 10 21.3	10.874
14	23 28 25.63	1.9682	7 59 28.0	10.901
15	23 30 23.62	1.9649	7 48 33.1	10.927
16	23 32 21.41	1.9616	7 37 36.7	10.952
17	23 34 19.01	1.9583	7 26 38.8	10.977
18	23 36 16.41	1.9551	7 15 39.5	11.000
19	23 38 13.62	1.9520	7 4 38.8	11.022
20	23 40 10.65	1.9490	6 53 36.8	11.044
21	23 42 7.50	1.9460	6 42 33.5	11.065
22	23 44 4.17	1.9431	6 31 29.0	11.085
23	23 46 0.67	1.9402	6 20 23.3	11.104
24	23 47 57.00	1.9374	S. 6 9 16.5	11.122

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	TUESDAY 13.			
	h m s	s	° ′ ″	″
0	23 47 57.00	1.9374	S. 6 9 16.5	11.122
1	23 49 53.16	1.9347	5 58 8.6	11.140
2	23 51 49.16	1.9319	5 46 59.7	11.157
3	23 53 44.99	1.9292	5 35 49.7	11.174
4	23 55 40.66	1.9266	5 24 38.8	11.189
5	23 57 36.18	1.9241	5 13 27.0	11.204
6	23 59 31.56	1.9217	5 2 14.3	11.218
7	0 1 26.79	1.9192	4 51 0.8	11.231
8	0 3 21.87	1.9168	4 39 46.6	11.244
9	0 5 16.81	1.9146	4 28 31.6	11.256
10	0 7 11.62	1.9123	4 17 15.9	11.267
11	0 9 6.29	1.9101	4 5 59.6	11.277
12	0 11 0.83	1.9079	3 54 42.7	11.287
13	0 12 55.24	1.9058	3 43 25.2	11.295
14	0 14 49.53	1.9038	3 32 7.3	11.302
15	0 16 43.70	1.9019	3 20 48.9	11.310
16	0 18 37.76	1.9001	3 9 30.1	11.317
17	0 20 31.71	1.8982	2 58 10.9	11.322
18	0 22 25.55	1.8964	2 46 51.4	11.327
19	0 24 19.28	1.8947	2 35 31.6	11.332
20	0 26 12.91	1.8930	2 24 11.6	11.335
21	0 28 6.44	1.8913	2 12 51.4	11.338
22	0 29 59.87	1.8897	2 1 31.0	11.341
23	0 31 53.20	1.8881	S. 1 50 10.5	11.342
	WEDNESDAY 14.			
0	0 33 46.44	1.8867	S. 1 38 49.9	11.343
1	0 35 39.60	1.8853	1 27 29.3	11.343
2	0 37 32.68	1.8840	1 16 8.7	11.342
3	0 39 25.68	1.8827	1 4 48.2	11.341
4	0 41 18.60	1.8814	0 53 27.8	11.339
5	0 43 11.45	1.8802	0 42 7.5	11.337
6	0 45 4.23	1.8791	0 30 47.3	11.335
7	0 46 56.94	1.8780	0 19 27.3	11.331
8	0 48 49.59	1.8770	S. 0 8 7.6	11.325
9	0 50 42.18	1.8760	N. 0 3 11.7	11.319
10	0 52 34.71	1.8751	0 14 30.7	11.313
11	0 54 27.19	1.8742	0 25 49.3	11.307
12	0 56 19.61	1.8733	0 37 7.6	11.301
13	0 58 11.99	1.8726	0 48 25.4	11.292
14	1 0 4.33	1.8719	0 59 42.6	11.283
15	1 1 56.62	1.8712	1 10 59.3	11.273
16	1 3 48.87	1.8706	1 22 15.4	11.263
17	1 5 41.09	1.8701	1 33 30.9	11.253
18	1 7 33.28	1.8696	1 44 45.8	11.242
19	1 9 25.44	1.8692	1 56 0.0	11.230
20	1 11 17.58	1.8688	2 7 13.4	11.217
21	1 13 9.69	1.8684	2 18 26.0	11.203
22	1 15 1.78	1.8681	2 29 37.8	11.189
23	1 16 53.86	1.8678	2 40 48.7	11.174
24	1 18 45.92	1.8676	N. 2 51 58.7	11.159

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	THURSDAY 15.			
	h m s	s	° ′ ″	″
0	1 18 45.92	1.8676	N. 2 51 58.7	11.159
1	1 20 37.97	1.8674	3 3 7.8	11.143
2	1 22 30.01	1.8673	3 14 15.9	11.126
3	1 24 22.05	1.8673	3 25 22.9	11.108
4	1 26 14.09	1.8673	3 36 28.9	11.091
5	1 28 6.13	1.8673	3 47 33.8	11.072
6	1 29 58.17	1.8674	3 58 37.6	11.053
7	1 31 50.22	1.8676	4 9 40.2	11.033
8	1 33 42.28	1.8678	4 20 41.5	11.012
9	1 35 34.35	1.8680	4 31 41.6	10.991
10	1 37 26.44	1.8683	4 42 40.4	10.969
11	1 39 18.55	1.8686	4 53 37.8	10.946
12	1 41 10.67	1.8689	5 4 33.9	10.923
13	1 43 2.82	1.8694	5 15 28.6	10.899
14	1 44 55.00	1.8698	5 26 21.8	10.874
15	1 46 47.20	1.8703	5 37 13.5	10.849
16	1 48 39.43	1.8708	5 48 3.7	10.823
17	1 50 31.70	1.8715	5 58 52.3	10.797
18	1 52 24.01	1.8722	6 9 39.3	10.770
19	1 54 16.36	1.8729	6 20 24.7	10.742
20	1 56 8.75	1.8736	6 31 8.3	10.713
21	1 58 1.19	1.8743	6 41 50.2	10.683
22	1 59 53.67	1.8751	6 52 30.3	10.653
23	2 1 46.20	1.8760	N. 7 3 8.6	10.623
	FRIDAY 16.			
0	2 3 38.79	1.8769	N. 7 13 45.1	10.592
1	2 5 31.43	1.8778	7 24 19.7	10.560
2	2 7 24.13	1.8788	7 34 52.3	10.528
3	2 9 16.89	1.8798	7 45 23.0	10.495
4	2 11 9.71	1.8809	7 55 51.7	10.461
5	2 13 2.60	1.8820	8 6 18.3	10.427
6	2 14 55.55	1.8831	8 16 42.9	10.392
7	2 16 48.57	1.8843	8 27 5.4	10.356
8	2 18 41.66	1.8855	8 37 25.7	10.319
9	2 20 34.83	1.8867	8 47 43.7	10.282
10	2 22 28.07	1.8880	8 57 59.5	10.244
11	2 24 21.39	1.8894	9 8 13.0	10.207
12	2 26 14.80	1.8908	9 18 24.3	10.168
13	2 28 8.29	1.8922	9 28 33.2	10.128
14	2 30 1.86	1.8936	9 38 39.6	10.087
15	2 31 55.52	1.8951	9 48 43.6	10.046
16	2 33 49.27	1.8966	9 58 45.1	10.005
17	2 35 43.11	1.8981	10 8 44.2	9.963
18	2 37 37.04	1.8997	10 18 40.7	9.920
19	2 39 31.07	1.9013	10 28 34.6	9.876
20	2 41 25.20	1.9030	10 38 25.8	9.832
21	2 43 19.43	1.9047	10 48 14.4	9.787
22	2 45 13.76	1.9064	10 58 0.3	9.742
23	2 47 8.19	1.9081	11 7 43.4	9.695
24	2 49 2.73	1.9099	N. 11 17 23.7	9.648

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY 17.			
	h m s	s	° ′ ″	″
0	2 49 2.73	1.9099	N.11 17 23.7	9.648
1	2 50 57.38	1.9117	11 27 1.2	9.601
2	2 52 52.14	1.9135	11 36 35.8	9.552
3	2 54 47.00	1.9153	11 46 7.5	9.503
4	2 56 41.98	1.9172	11 55 36.2	9.453
5	2 58 37.07	1.9192	12 5 1.9	9.404
6	3 0 32.28	1.9212	12 14 24.7	9.354
7	3 2 27.61	1.9232	12 23 44.4	9.302
8	3 4 23.06	1.9251	12 33 0.9	9.249
9	3 6 18.62	1.9271	12 42 14.3	9.197
10	3 8 14.31	1.9292	12 51 24.6	9.144
11	3 10 10.12	1.9313	13 0 31.6	9.089
12	3 12 6.06	1.9334	13 9 35.3	9.034
13	3 14 2.13	1.9356	13 18 35.7	8.979
14	3 15 58.32	1.9377	13 27 32.8	8.923
15	3 17 54.65	1.9398	13 36 26.5	8.866
16	3 19 51.10	1.9420	13 45 16.8	8.809
17	3 21 47.69	1.9442	13 54 3.6	8.752
18	3 23 44.41	1.9465	14 2 47.0	8.693
19	3 25 41.27	1.9487	14 11 26.8	8.633
20	3 27 38.26	1.9510	14 20 3.0	8.573
21	3 29 35.39	1.9533	14 28 35.6	8.513
22	3 31 32.66	1.9557	14 37 4.6	8.452
23	3 33 30.07	1.9580	N.14 45 29.9	8.390
	SUNDAY 18.			
0	3 35 27.62	1.9603	N.14 53 51.4	8.327
1	3 37 25.31	1.9627	15 2 9.1	8.264
2	3 39 23.14	1.9651	15 10 23.1	8.201
3	3 41 21.12	1.9675	15 18 33.3	8.137
4	3 43 19.24	1.9699	15 26 39.6	8.072
5	3 45 17.51	1.9723	15 34 41.9	8.006
6	3 47 15.92	1.9747	15 42 40.3	7.940
7	3 49 14.48	1.9772	15 50 34.7	7.873
8	3 51 13.19	1.9797	15 58 25.0	7.805
9	3 53 12.05	1.9822	16 6 11.3	7.737
10	3 55 11.05	1.9846	16 13 53.5	7.668
11	3 57 10.20	1.9871	16 21 31.5	7.598
12	3 59 9.50	1.9897	16 29 5.3	7.528
13	4 1 8.96	1.9922	16 36 34.9	7.457
14	4 3 8.56	1.9946	16 44 0.2	7.386
15	4 5 8.31	1.9971	16 51 21.2	7.314
16	4 7 8.21	1.9997	16 58 37.9	7.242
17	4 9 8.27	2.0022	17 5 50.3	7.170
18	4 11 8.48	2.0047	17 12 58.3	7.096
19	4 13 8.84	2.0072	17 20 1.8	7.021
20	4 15 9.35	2.0098	17 27 0.8	6.946
21	4 17 10.02	2.0124	17 33 55.3	6.871
22	4 19 10.84	2.0149	17 40 45.3	6.795
23	4 21 11.81	2.0175	17 47 30.7	6.718
24	4 23 12.94	2.0201	N.17 54 11.4	6.640

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	MONDAY 19.			
	h m s	s	° ′ ″	″
0	4 23 12.94	2.0201	N.17 54 11.4	6.640
1	4 25 14.22	2.0226	18 0 47.5	6.562
2	4 27 15.65	2.0251	18 7 18.9	6.483
3	4 29 17.23	2.0277	18 13 45.5	6.404
4	4 31 18.97	2.0302	18 20 7.4	6.325
5	4 33 20.86	2.0327	18 26 24.5	6.245
6	4 35 22.90	2.0352	18 32 36.8	6.164
7	4 37 25.09	2.0377	18 38 44.2	6.083
8	4 39 27.43	2.0403	18 44 46.7	6.001
9	4 41 29.93	2.0428	18 50 44.3	5.918
10	4 43 32.57	2.0453	18 56 36.9	5.835
11	4 45 35.36	2.0478	19 2 24.5	5.752
12	4 47 38.31	2.0504	19 8 7.1	5.667
13	4 49 41.41	2.0529	19 13 44.6	5.582
14	4 51 44.65	2.0553	19 19 17.0	5.497
15	4 53 48.04	2.0577	19 24 44.3	5.412
16	4 55 51.57	2.0601	19 30 6.4	5.325
17	4 57 55.25	2.0626	19 35 23.3	5.238
18	4 59 59.08	2.0650	19 40 35.0	5.151
19	5 2 3.05	2.0673	19 45 41.4	5.063
20	5 4 7.16	2.0697	19 50 42.5	4.975
21	5 6 11.42	2.0721	19 55 38.4	4.887
22	5 8 15.82	2.0745	20 0 28.9	4.797
23	5 10 20.36	2.0768	N.20 5 14.0	4.707
	TUESDAY 20.			
0	5 12 25.04	2.0792	N.20 9 53.7	4.617
1	5 14 29.86	2.0815	20 14 28.0	4.526
2	5 16 34.82	2.0837	20 18 56.8	4.434
3	5 18 39.91	2.0860	20 23 20.1	4.342
4	5 20 45.14	2.0882	20 27 37.9	4.250
5	5 22 50.50	2.0904	20 31 50.1	4.157
6	5 24 55.99	2.0927	20 35 56.7	4.063
7	5 27 1.62	2.0948	20 39 57.7	3.970
8	5 29 7.37	2.0969	20 43 53.1	3.877
9	5 31 13.25	2.0991	20 47 42.9	3.783
10	5 33 19.26	2.1012	20 51 27.0	3.687
11	5 35 25.39	2.1032	20 55 5.3	3.591
12	5 37 31.64	2.1052	20 58 37.9	3.495
13	5 39 38.02	2.1073	21 2 4.7	3.399
14	5 41 44.52	2.1093	21 5 25.8	3.303
15	5 43 51.14	2.1113	21 8 41.1	3.207
16	5 45 57.88	2.1132	21 11 50.6	3.109
17	5 48 4.73	2.1151	21 14 54.2	3.011
18	5 50 11.69	2.1170	21 17 51.9	2.912
19	5 52 18.77	2.1189	21 20 43.7	2.814
20	5 54 25.96	2.1207	21 23 29.6	2.716
21	5 56 33.25	2.1224	21 26 9.6	2.617
22	5 58 40.65	2.1242	21 28 43.6	2.517
23	6 0 48.15	2.1259	21 31 11.6	2.417
24	6 2 55.76	2.1277	N.21 33 33.7	2.317

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 21.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	6 2 55.76	2.1277	N.21 33 33.7	2.317
1	6 5 3.47	2.1293	21 35 49.7	2.217
2	6 7 11.28	2.1309	21 37 59.7	2.116
3	6 9 19.18	2.1325	21 40 3.6	2.014
4	6 11 27.18	2.1341	21 42 1.4	1.913
5	6 13 35.27	2.1356	21 43 53.1	1.812
6	6 15 43.45	2.1371	21 45 38.8	1.710
7	6 17 51.72	2.1386	21 47 18.3	1.607
8	6 20 0.08	2.1400	21 48 51.7	1.505
9	6 22 8.52	2.1414	21 50 18.9	1.402
10	6 24 17.05	2.1427	21 51 39.9	1.299
11	6 26 25.65	2.1440	21 52 54.8	1.196
12	6 28 34.33	2.1453	21 54 3.5	1.092
13	6 30 43.09	2.1466	21 55 5.9	0.988
14	6 32 51.92	2.1478	21 56 2.1	0.885
15	6 35 0.82	2.1489	21 56 52.1	0.781
16	6 37 9.79	2.1501	21 57 35.8	0.677
17	6 39 18.83	2.1512	21 58 13.3	0.572
18	6 41 27.93	2.1522	21 58 44.5	0.467
19	6 43 37.10	2.1532	21 59 9.4	0.362
20	6 45 46.32	2.1542	21 59 28.0	0.257
21	6 47 55.60	2.1551	21 59 40.3	0.152
22	6 50 4.93	2.1560	21 59 46.3	+ 0.047
23	6 52 14.32	2.1569	N.21 59 46.0	− 0.058

THURSDAY 22.

0	6 54 23.76	2.1577	N.21 59 39.3	0.164
1	6 56 33.25	2.1585	21 59 26.3	0.270
2	6 58 42.78	2.1592	21 59 6.9	0.376
3	7 0 52.36	2.1600	21 58 41.2	0.481
4	7 3 1.98	2.1607	21 58 9.2	0.587
5	7 5 11.64	2.1613	21 57 30.8	0.693
6	7 7 21.34	2.1619	21 56 46.0	0.799
7	7 9 31.07	2.1625	21 55 54.9	0.905
8	7 11 40.84	2.1631	21 54 57.4	1.012
9	7 13 50.64	2.1636	21 53 53.5	1.118
10	7 16 0.47	2.1640	21 52 43.2	1.225
11	7 18 10.32	2.1644	21 51 26.5	1.331
12	7 20 20.20	2.1648	21 50 3.5	1.437
13	7 22 30.10	2.1652	21 48 34.1	1.543
14	7 24 40.02	2.1655	21 46 58.3	1.650
15	7 26 49.96	2.1657	21 45 16.1	1.756
16	7 28 59.91	2.1660	21 43 27.5	1.862
17	7 31 9.88	2.1662	21 41 32.6	1.968
18	7 33 19.86	2.1664	21 39 31.3	2.075
19	7 35 29.85	2.1665	21 37 23.6	2.181
20	7 37 39.84	2.1666	21 35 9.5	2.287
21	7 39 49.84	2.1667	21 32 49.1	2.393
22	7 41 59.84	2.1667	21 30 22.3	2.499
23	7 44 9.84	2.1668	21 27 49.2	2.605
24	7 46 19.85	2.1668	N.21 25 9.7	2.711

FRIDAY 23.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	7 46 19.85	2.1668	N.21 25 9.7	2.711
1	7 48 29.85	2.1667	21 22 23.8	2.817
2	7 50 39.85	2.1666	21 19 31.6	2.922
3	7 52 49.84	2.1664	21 16 33.1	3.028
4	7 54 59.82	2.1663	21 13 28.2	3.134
5	7 57 9.79	2.1662	21 10 17.0	3.239
6	7 59 19.76	2.1660	21 6 59.5	3.344
7	8 1 29.71	2.1657	21 3 35.7	3.449
8	8 3 39.64	2.1654	21 0 5.6	3.554
9	8 5 49.56	2.1651	20 56 29.2	3.659
10	8 7 59.46	2.1648	20 52 46.5	3.764
11	8 10 9.34	2.1645	20 48 57.5	3.868
12	8 12 19.20	2.1642	20 45 2.3	3.972
13	8 14 29.04	2.1638	20 41 0.8	4.077
14	8 16 38.85	2.1633	20 36 53.1	4.181
15	8 18 48.64	2.1629	20 32 39.1	4.285
16	8 20 58.40	2.1624	20 28 18.9	4.388
17	8 23 8.13	2.1619	20 23 52.6	4.490
18	8 25 17.83	2.1614	20 19 20.1	4.593
19	8 27 27.50	2.1609	20 14 41.4	4.696
20	8 29 37.14	2.1603	20 9 56.5	4.799
21	8 31 46.74	2.1598	20 5 5.5	4.901
22	8 33 56.31	2.1593	20 0 8.4	5.003
23	8 36 5.85	2.1587	N.19 55 5.2	5.105

SATURDAY 24.

0	8 38 15.35	2.1580	N.19 49 55.8	5.207
1	8 40 24.81	2.1573	19 44 40.4	5.308
2	8 42 34.23	2.1567	19 39 18.9	5.408
3	8 44 43.62	2.1561	19 33 51.4	5.508
4	8 46 52.97	2.1555	19 28 17.9	5.609
5	8 49 2.28	2.1548	19 22 38.3	5.710
6	8 51 11.54	2.1540	19 16 52.7	5.809
7	8 53 20.76	2.1533	19 11 1.2	5.908
8	8 55 29.94	2.1526	19 5 3.7	6.007
9	8 57 39.08	2.1519	18 59 0.3	6.106
10	8 59 48.17	2.1512	18 52 51.0	6.204
11	9 1 57.22	2.1505	18 46 35.8	6.302
12	9 4 6.23	2.1497	18 40 14.7	6.400
13	9 6 15.19	2.1489	18 33 47.8	6.497
14	9 8 24.10	2.1482	18 27 15.1	6.594
15	9 10 32.97	2.1475	18 20 36.5	6.691
16	9 12 41.80	2.1467	18 13 52.2	6.787
17	9 14 50.58	2.1459	18 7 2.1	6.882
18	9 16 59.31	2.1452	18 0 6.3	6.977
19	9 19 8.00	2.1444	17 53 4.8	7.072
20	9 21 16.64	2.1436	17 45 57.6	7.167
21	9 23 25.23	2.1428	17 38 44.7	7.262
22	9 25 33.78	2.1421	17 31 26.2	7.355
23	9 27 42.28	2.1413	17 24 2.1	7.448
24	9 29 50.74	2.1406	N.17 16 32.5	7.540

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 25.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	9 29 50.74	2.1406	N.17 16 32.5	7.540
1	9 31 59.15	2.1398	17 8 57.3	7.632
2	9 34 7.52	2.1391	17 1 16.6	7.725
3	9 36 15.84	2.1383	16 53 30.3	7.817
4	9 38 24.12	2.1376	16 45 38.6	7.908
5	9 40 32.36	2.1369	16 37 41.4	7.998
6	9 42 40.55	2.1362	16 29 38.8	8.088
7	9 44 48.70	2.1355	16 21 30.8	8.177
8	9 46 56.81	2.1348	16 13 17.5	8.267
9	9 49 4.88	2.1342	16 4 58.8	8.356
10	9 51 12.91	2.1335	15 56 34.8	8.444
11	9 53 20.90	2.1328	15 48 5.6	8.531
12	9 55 28.85	2.1322	15 39 31.1	8.618
13	9 57 36.76	2.1315	15 30 51.4	8.705
14	9 59 44.63	2.1309	15 22 6.5	8.791
15	10 1 52.47	2.1304	15 13 16.5	8.876
16	10 4 0.28	2.1298	15 4 21.4	8.961
17	10 6 8.05	2.1292	14 55 21.2	9.046
18	10 8 15.79	2.1287	14 46 15.9	9.130
19	10 10 23.50	2.1282	14 37 5.6	9.213
20	10 12 31.18	2.1277	14 27 50.3	9.296
21	10 14 38.83	2.1272	14 18 30.1	9.378
22	10 16 46.45	2.1268	14 9 4.9	9.460
23	10 18 54.05	2.1264	N.13 59 34.9	9.541

MONDAY 26.

0	10 21 1.62	2.1260	N.13 50 0.0	9.622
1	10 23 9.17	2.1257	13 40 20.3	9.702
2	10 25 16.70	2.1253	13 30 35.8	9.781
3	10 27 24.21	2.1250	13 20 46.6	9.859
4	10 29 31.70	2.1247	13 10 52.7	9.937
5	10 31 39.18	2.1245	13 0 54.1	10.015
6	10 33 46.64	2.1242	12 50 50.9	10.092
7	10 35 54.08	2.1240	12 40 43.1	10.168
8	10 38 1.52	2.1239	12 30 30.7	10.244
9	10 40 8.95	2.1238	12 20 13.8	10.319
10	10 42 16.37	2.1237	12 9 52.4	10.393
11	10 44 23.79	2.1237	11 59 26.6	10.467
12	10 46 31.21	2.1236	11 48 56.4	10.540
13	10 48 38.62	2.1236	11 38 21.8	10.612
14	10 50 46.04	2.1237	11 27 42.9	10.683
15	10 52 53.46	2.1237	11 16 59.8	10.753
16	10 55 0.89	2.1238	11 6 12.5	10.824
17	10 57 8.32	2.1239	10 55 20.9	10.895
18	10 59 15.76	2.1241	10 44 25.1	10.964
19	11 1 23.21	2.1243	10 33 25.2	11.032
20	11 3 30.68	2.1246	10 22 21.3	11.099
21	11 5 38.17	2.1250	10 11 13.4	11.165
22	11 7 45.68	2.1253	10 0 1.5	11.231
23	11 9 53.21	2.1257	9 48 45.7	11.297
24	11 12 0.77	2.1262	N. 9 37 25.9	11.362

TUESDAY 27.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	11 12 0.77	2.1262	N. 9 37 25.9	11.362
1	11 14 8.36	2.1267	9 26 2.3	11.425
2	11 16 15.98	2.1272	9 14 34.9	11.487
3	11 18 23.62	2.1277	9 3 3.8	11.549
4	11 20 31.30	2.1283	8 51 29.0	11.611
5	11 22 39.02	2.1290	8 39 50.5	11.671
6	11 24 46.78	2.1297	8 28 8.5	11.730
7	11 26 54.58	2.1304	8 16 22.9	11.789
8	11 29 2.43	2.1312	8 4 33.8	11.847
9	11 31 10.33	2.1321	7 52 41.3	11.904
10	11 33 18.28	2.1330	7 40 45.3	11.961
11	11 35 26.29	2.1340	7 28 45.9	12.017
12	11 37 34.36	2.1350	7 16 43.2	12.072
13	11 39 42.49	2.1360	7 4 37.3	12.125
14	11 41 50.68	2.1371	6 52 28.2	12.178
15	11 43 58.94	2.1382	6 40 15.9	12.230
16	11 46 7.27	2.1394	6 28 0.6	12.281
17	11 48 15.67	2.1407	6 15 42.2	12.332
18	11 50 24.15	2.1420	6 3 20.8	12.381
19	11 52 32.71	2.1434	5 50 56.5	12.429
20	11 54 41.36	2.1448	5 38 29.3	12.477
21	11 56 50.09	2.1462	5 25 59.3	12.523
22	11 58 58.91	2.1477	5 13 26.6	12.568
23	12 1 7.82	2.1493	N. 5 0 51.2	12.613

WEDNESDAY 28.

0	12 3 16.83	2.1510	N. 4 48 13.1	12.657
1	12 5 25.94	2.1527	4 35 32.4	12.699
2	12 7 35.15	2.1544	4 22 49.2	12.740
3	12 9 44.47	2.1562	4 10 3.6	12.780
4	12 11 53.90	2.1581	3 57 15.6	12.820
5	12 14 3.44	2.1599	3 44 25.2	12.858
6	12 16 13.09	2.1618	3 31 32.6	12.895
7	12 18 22.86	2.1639	3 18 37.8	12.932
8	12 20 32.76	2.1660	3 5 40.8	12.967
9	12 22 42.78	2.1681	2 52 41.7	13.001
10	12 24 52.93	2.1703	2 39 40.7	13.034
11	12 27 3.22	2.1726	2 26 37.7	13.066
12	12 29 13.65	2.1749	2 13 32.8	13.097
13	12 31 24.21	2.1772	2 0 26.1	13.126
14	12 33 34.92	2.1797	1 47 17.7	13.154
15	12 35 45.78	2.1822	1 34 7.6	13.182
16	12 37 56.79	2.1847	1 20 55.9	13.208
17	12 40 7.95	2.1873	1 7 42.6	13.233
18	12 42 19.27	2.1900	0 54 27.9	13.257
19	12 44 30.75	2.1928	0 41 11.8	13.279
20	12 46 42.40	2.1956	0 27 54.4	13.300
21	12 48 54.22	2.1984	0 14 35.8	13.320
22	12 51 6.21	2.2013	N. 0 1 16.0	13.339
23	12 53 18.37	2.2042	S. 0 12 4.9	13.357
24	12 55 30.71	2.2072	S. 0 25 26.8	13.373

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
THURSDAY 29.				
0	12 55 30.71	2.2072	S. 0 25 26.8	13.373
1	12 57 43.24	2.2103	0 38 49.6	13.388
2	12 59 55.95	2.2134	0 52 13.3	13.402
3	13 2 8.85	2.2166	1 5 37.8	13.413
4	13 4 21.95	2.2199	1 19 2.9	13.424
5	13 6 35.24	2.2232	1 32 28.7	13.434
6	13 8 48.73	2.2266	1 45 55.0	13.442
7	13 11 2.43	2.2301	1 59 21.8	13.449
8	13 13 16.34	2.2335	2 12 48.9	13.454
9	13 15 30.45	2.2370	2 26 16.3	13.458
10	13 17 44.78	2.2406	2 39 43.9	13.461
11	13 19 59.33	2.2443	2 53 11.6	13.462
12	13 22 14.10	2.2480	3 6 39.4	13.462
13	13 24 29.09	2.2518	3 20 7.1	13.460
14	13 26 44.31	2.2557	3 33 34.6	13.457
15	13 28 59.77	2.2596	3 47 1.9	13.453
16	13 31 15.46	2.2635	4 0 28.9	13.447
17	13 33 31.39	2.2675	4 13 55.5	13.438
18	13 35 47.56	2.2715	4 27 21.5	13.428
19	13 38 3.97	2.2756	4 40 46.9	13.418
20	13 40 20.63	2.2798	4 54 11.7	13.407
21	13 42 37.54	2.2840	5 7 35.7	13.393
22	13 44 54.71	2.2882	5 20 58.8	13.377
23	13 47 12.13	2.2925	S. 5 34 20.9	13.360
FRIDAY 30.				
0	13 49 29.81	2.2968	S. 5 47 42.0	13.342
1	13 51 47.75	2.3012	6 1 1.9	13.321
2	13 54 5.96	2.3057	6 14 20.5	13.299
3	13 56 24.44	2.3102	6 27 37.8	13.276
4	13 58 43.19	2.3148	6 40 53.6	13.250
5	14 1 2.22	2.3194	6 54 7.8	13.223
6	14 3 21.52	2.3240	7 7 20.4	13.195
7	14 5 41.10	2.3287	7 20 31.2	13.165
8	14 8 0.96	2.3334	7 33 40.2	13.133
9	14 10 21.11	2.3382	7 46 47.2	13.099
10	14 12 41.54	2.3430	7 59 52.1	13.063
11	14 15 2.27	2.3479	8 12 54.8	13.027
12	14 17 23.29	2.3528	8 25 55.3	12.988
13	14 19 44.60	2.3577	8 38 53.4	12.947
14	14 22 6.21	2.3627	8 51 49.0	12.905
15	14 24 28.12	2.3677	9 4 42.0	12.861
16	14 26 50.33	2.3727	9 17 32.3	12.815
17	14 29 12.84	2.3778	9 30 19.8	12.767
18	14 31 35.66	2.3829	9 43 4.4	12.718
19	14 33 58.79	2.3880	9 55 46.0	12.667
20	14 36 22.22	2.3931	10 8 24.4	12.613
21	14 38 45.96	2.3982	10 20 59.6	12.558
22	14 41 10.01	2.4034	10 33 31.4	12.502
23	14 43 34.37	2.4087	10 45 59.8	12.443
24	14 45 59.05	2.4139	S. 10 58 24.6	12.382

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
SATURDAY, DECEMBER 1.				
0	14 45 59.05	2.4139	S. 10 58 24.6	12.382

PHASES OF THE MOON.

		d	h	m
●	New Moon . . Nov.	3	12	2.4
☽	First Quarter . . .	10	4	15.7
○	Full Moon	18	3	15.9
☾	Last Quarter	26	5	20.4

		d	h
☾	Perigee . . . Nov.	4	3.2
☾	Apogee	18	16.2

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	III^h.	P. L. of Diff.	VI^h.	P. L. of Diff.	IX^h.	P. L. of Diff.
1	Pollux	W.	72° 29′ 31″	2219	74° 17′ 30″	2203	76° 5′ 53″	2187	77° 54′ 40″	2171
	Regulus	W.	36 29 32	2195	38 18 7	2178	40 7 8	2162	41 56 33	2147
	Sun	E.	35 13 53	2545	33 33 43	2533	31 53 15	2521	30 12 31	2512
5	Sun	W.	21 40 41	2398	23 24 19	2391	25 8 6	2388	26 51 58	2387
	Fomalhaut	E.	88 57 13	2210	87 9 1	2218	85 21 0	2227	83 33 12	2236
	α Pegasi	E.	104 42 11	2401	102 58 38	2401	101 15 5	2403	99 31 35	2407
6	Sun	W.	35 30 39	2412	37 13 57	2420	38 57 3	2430	40 39 55	2441
	Fomalhaut	E.	74 38 14	2300	72 52 14	2316	71 6 38	2333	69 21 27	2352
	α Pegasi	E.	90 56 3	2446	89 13 34	2458	87 31 22	2471	85 49 28	2486
7	Sun	W.	49 9 58	2507	50 51 1	2522	52 31 44	2538	54 12 5	2553
	Jupiter	W.	24 21 43	2268	26 8 29	2279	27 54 59	2291	29 41 11	2304
	Venus	W.	18 37 22	2672	20 14 39	2672	21 51 57	2675	23 29 11	2681
	Fomalhaut	E.	60 42 50	2463	59 0 45	2490	57 19 18	2518	55 38 30	2548
	α Pegasi	E.	77 25 38	2576	75 46 10	2598	74 7 12	2621	72 28 45	2645
8	Sun	W.	62 28 13	2638	64 6 17	2655	65 43 57	2673	67 21 13	2690
	Jupiter	W.	38 27 4	2380	40 11 8	2396	41 54 49	2412	43 38 7	2428
	Venus	W.	31 32 25	2738	33 8 14	2753	34 43 44	2769	36 18 53	2784
	Fomalhaut	E.	47 25 32	2725	45 49 26	2769	44 14 18	2816	42 40 11	2866
	α Pegasi	E.	64 25 13	2786	62 50 27	2818	61 16 23	2852	59 43 3	2888
9	Sun	W.	75 21 35	2781	76 56 28	2799	78 30 57	2818	80 5 2	2836
	Jupiter	W.	52 8 43	2512	53 49 39	2530	55 30 11	2546	57 10 20	2563
	Venus	W.	44 9 22	2868	45 42 22	2885	47 15 0	2902	48 47 16	2920
	Mars	W.	20 11 29	2714	21 47 50	2728	23 23 53	2741	24 59 38	2756
	Fomalhaut	E.	35 7 31	3196	33 41 17	3285	32 16 48	3386	30 54 15	3498
	α Pegasi	E.	52 8 41	3101	50 40 33	3152	49 13 26	3206	47 47 24	3264
	α Arietis	E.	93 17 25	2583	91 38 6	2600	89 59 11	2617	88 20 39	2634
10	Sun	W.	87 49 41	2924	89 21 30	2941	90 52 57	2958	92 24 2	2975
	Jupiter	W.	65 25 22	2646	67 3 15	2661	68 40 47	2678	70 17 57	2692
	Venus	W.	56 23 4	3006	57 53 9	3023	59 22 53	3039	60 52 17	3056
	Mars	W.	32 53 20	2835	34 27 3	2851	36 0 25	2866	37 33 27	2882
	α Arietis	E.	80 13 49	2721	78 37 37	2739	77 1 49	2756	75 26 24	2775
	Aldebaran	E.	111 31 46	2569	109 52 9	2585	108 12 54	2601	106 34 0	2617
11	Sun	W.	99 54 19	3055	101 23 24	3070	102 52 10	3086	104 20 37	3101
	Jupiter	W.	78 18 41	2768	79 53 51	2782	81 28 43	2796	83 3 16	2810
	Venus	W.	68 14 14	3137	69 41 39	3152	71 8 46	3166	72 35 36	3180
	Mars	W.	45 13 42	2958	46 44 47	2973	48 15 34	2986	49 46 4	3000
	α Aquilæ	W.	42 46 10	4297	43 53 5	4218	45 1 14	4149	46 10 29	4085
	α Arietis	E.	67 35 15	2866	66 2 12	2884	64 29 33	2903	62 57 18	2922
	Aldebaran	E.	98 24 42	2690	96 47 49	2704	95 11 15	2718	93 34 59	2732
12	Sun	W.	111 38 28	3170	113 5 13	3183	114 31 42	3196	115 57 56	3209
	Jupiter	W.	90 51 40	2874	92 24 32	2886	93 57 9	2898	95 29 31	2909
	Venus	W.	79 45 30	3250	81 10 40	3262	82 35 36	3275	84 0 17	3287
	Mars	W.	57 14 19	3067	58 43 9	3078	60 11 45	3091	61 40 6	3102
	α Aquilæ	W.	52 10 2	3861	53 24 1	3829	54 38 33	3802	55 53 33	3777

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^h.	P. L. of Diff.	XVIII^h.	P. L. of Diff.	XXI^h.	P. L. of Diff.
1	Pollux	W.	79° 43′ 51″	2156	81° 33′ 25″	2142	83° 23′ 20″	2128	85° 13′ 36″	2115
	Regulus	W.	43 46 21	2132	45 36 32	2117	47 27 6	2103	49 18 1	2090
	Sun	E.	28 31 34	2503	26 50 25	2497	25 9 7	2494	23 27 45	2494
5	Sun	W.	28 35 52	2388	30 19 44	2391	32 3 31	2397	33 47 10	2404
	Fomalhaut	E.	81 45 38	2246	79 58 19	2258	78 11 18	2271	76 24 36	2285
	α Pegasi	E.	97 48 10	2412	96 4 52	2419	94 21 44	2426	92 38 47	2436
6	Sun	W.	42 22 31	2453	44 4 50	2465	45 46 52	2479	47 28 35	2493
	Fomalhaut	E.	67 36 43	2372	65 52 28	2393	64 8 43	2415	62 25 30	2438
	α Pegasi	E.	84 7 55	2502	82 26 44	2518	80 45 56	2537	79 5 34	2556
7	Sun	W.	55 52 4	2569	57 31 41	2586	59 10 55	2603	60 49 46	2621
	Jupiter	W.	31 27 4	2318	33 12 37	2333	34 57 48	2348	36 42 37	2364
	Venus	W.	25 6 17	2689	26 43 12	2699	28 19 53	2711	29 56 18	2725
	Fomalhaut	E.	53 58 23	2579	52 18 59	2612	50 40 21	2648	49 2 31	2686
	α Pegasi	E.	70 50 51	2670	69 13 31	2697	67 36 47	2725	66 0 40	2755
8	Sun	W.	68 58 6	2708	70 34 35	2727	72 10 39	2745	73 46 19	2763
	Jupiter	W.	45 21 2	2445	47 3 33	2462	48 45 40	2479	50 27 23	2495
	Venus	W.	37 53 42	2800	39 28 10	2817	41 2 16	2834	42 36 0	2851
	Fomalhaut	E.	41 7 8	2920	39 35 15	2980	38 4 37	3045	36 35 20	3117
	α Pegasi	E.	58 10 29	2927	56 38 44	2966	55 7 49	3009	53 37 47	3054
9	Sun	W.	81 38 43	2854	83 12 1	2871	84 44 57	2889	86 17 30	2906
	Jupiter	W.	58 50 6	2580	60 29 29	2596	62 8 29	2612	63 47 7	2629
	Venus	W.	50 19 9	2938	51 50 40	2954	53 21 50	2972	54 52 38	2989
	Mars	W.	26 35 3	2772	28 10 8	2787	29 44 53	2803	31 19 17	2819
	Fomalhaut	E.	29 33 49	3627	28 15 44	3776	27 0 17	3948	25 47 46	4149
	α Pegasi	E.	46 22 30	3325	44 58 48	3393	43 36 23	3465	42 15 20	3544
	α Arietis	E.	86 42 30	2652	85 4 45	2669	83 27 23	2686	81 50 24	2704
10	Sun	W.	93 54 46	2992	95 25 9	3008	96 55 12	3024	98 24 55	3039
	Jupiter	W.	71 54 47	2708	73 31 16	2724	75 7 24	2739	76 43 12	2753
	Venus	W.	62 21 20	3073	63 50 3	3089	65 18 26	3105	66 46 30	3121
	Mars	W.	39 6 9	2897	40 38 32	2912	42 10 35	2928	43 42 18	2943
	α Arietis	E.	73 51 23	2793	72 16 46	2811	70 42 32	2829	69 8 42	2847
	Aldebaran	E.	104 55 28	2632	103 17 16	2647	101 39 25	2662	100 1 54	2676
11	Sun	W.	105 48 45	3115	107 16 36	3129	108 44 10	3143	110 11 27	3157
	Jupiter	W.	84 37 31	2824	86 11 28	2837	87 45 8	2849	89 18 32	2862
	Venus	W.	74 2 9	3195	75 28 24	3209	76 54 22	3223	78 20 4	3236
	Mars	W.	51 16 17	3014	52 46 13	3027	54 15 52	3041	55 45 14	3055
	α Aquilæ	W.	47 20 45	4030	48 31 55	3979	49 43 55	3935	50 56 39	3897
	α Arietis	E.	61 25 27	2941	59 54 0	2961	58 22 58	2980	56 52 20	3000
	Aldebaran	E.	91 59 2	2745	90 23 22	2758	88 47 59	2770	87 12 52	2783
12	Sun	W.	117 23 55	3220	118 49 40	3232	120 15 11	3244	121 40 28	3256
	Jupiter	W.	97 1 38	2920	98 33 31	2931	100 5 11	2942	101 36 37	2952
	Venus	W.	85 24 44	3299	86 48 57	3311	88 12 56	3322	89 36 42	3332
	Mars	W.	63 8 13	3114	64 36 6	3125	66 3 45	3136	67 31 11	3146
	α Aquilæ	W.	57 8 59	3755	58 24 48	3735	59 40 58	3717	60 57 27	3702

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	III^h.	P. L. of Diff.	VI^h.	P. L. of Diff.	IX^h.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
12	α Arietis	E.	55 22 7	3021	53 52 20	3042	52 22 59	3063	50 54 4	3086
	Aldebaran	E.	85 38 2	2795	84 3 28	2807	82 29 9	2818	80 55 5	2829
13	Sun	W.	123 5 31	3267	124 30 21	3277	125 54 59	3288	127 19 25	3298
	Venus	W.	91 0 16	3343	92 23 38	3353	93 46 48	3364	95 9 46	3373
	Mars	W.	68 58 25	3156	70 25 27	3166	71 52 17	3176	73 18 55	3186
	α Aquilæ	W.	62 14 12	3688	63 31 12	3676	64 48 25	3665	66 5 49	3656
	α Arietis	E.	43 36 43	3214	42 10 50	3243	40 45 32	3275	39 20 51	3309
	Aldebaran	E.	73 8 12	2850	71 35 28	2890	70 2 56	2900	68 30 37	2909
14	Venus	W.	102 1 58	3417	103 23 55	3425	104 45 43	3432	106 7 23	3440
	Mars	W.	80 29 25	3227	81 55 2	3235	83 20 30	3242	84 45 49	3249
	α Aquilæ	W.	72 34 54	3626	73 53 0	3623	75 11 10	3620	76 29 23	3619
	Fomalhaut	W.	37 28 16	3564	38 47 30	3531	40 7 20	3502	41 27 42	3477
	Aldebaran	E.	60 51 41	2949	59 20 24	2956	57 49 16	2962	56 18 16	2969
15	Mars	W.	91 50 27	3281	93 15 1	3286	94 39 29	3291	96 3 51	3296
	α Aquilæ	W.	83 0 37	3621	84 18 49	3622	85 37 0	3624	86 55 8	3627
	Fomalhaut	W.	48 15 32	3389	49 38 1	3377	51 0 44	3366	52 23 39	3357
	α Pegasi	W.	36 21 10	4287	37 28 15	4205	38 36 36	4134	39 46 5	4070
	Aldebaran	E.	48 45 18	3000	47 15 5	3005	45 44 58	3010	44 14 58	3015
	Pollux	E.	92 58 42	3026	91 29 1	3031	89 59 27	3036	88 29 59	3041
16	Fomalhaut	W.	59 20 38	3323	60 44 23	3318	62 8 14	3313	63 32 11	3308
	α Pegasi	W.	45 47 21	3832	47 1 50	3798	48 16 54	3767	49 32 31	3738
	Aldebaran	E.	36 46 26	3038	35 17 0	3043	33 47 40	3046	32 18 24	3050
	Pollux	E.	81 4 3	3062	79 35 7	3066	78 6 16	3070	76 37 30	3073
	Saturn	E.	108 51 45	3042	107 22 24	3046	105 53 8	3049	104 23 56	3052
17	Fomalhaut	W.	70 32 54	3295	71 57 11	3293	73 21 31	3292	74 45 52	3290
	α Pegasi	W.	55 57 18	3629	57 15 21	3612	58 33 42	3597	59 52 20	3583
	Pollux	E.	69 14 40	3090	67 46 18	3092	66 17 59	3095	64 49 43	3098
	Saturn	E.	96 58 47	3065	95 29 55	3067	94 1 5	3069	92 32 17	3071
	Regulus	E.	105 0 26	3059	103 31 26	3061	102 2 29	3063	100 33 34	3065
18	Fomalhaut	W.	81 48 1	3285	83 12 30	3285	84 36 59	3284	86 1 29	3284
	α Pegasi	W.	66 28 55	3528	67 48 48	3519	69 8 51	3511	70 29 3	3504
	Pollux	E.	57 29 14	3111	56 1 18	3113	54 33 24	3115	53 5 33	3118
	Saturn	E.	85 8 48	3077	83 40 10	3078	82 11 34	3079	80 42 59	3079
	Regulus	E.	93 9 29	3072	91 40 45	3073	90 12 2	3073	88 43 19	3073
19	Fomalhaut	W.	93 3 59	3285	94 28 28	3285	95 52 57	3286	97 17 25	3286
	α Pegasi	W.	77 11 53	3474	78 32 46	3471	79 53 43	3466	81 14 45	3463
	α Arietis	W.	33 38 10	3578	34 57 8	3542	36 16 46	3509	37 37 0	3480
	Pollux	E.	45 47 3	3131	44 19 31	3133	42 52 2	3136	41 24 36	3139
	Saturn	E.	73 20 7	3079	71 51 32	3079	70 22 57	3078	68 54 21	3078
	Regulus	E.	81 19 55	3074	79 51 14	3074	78 22 33	3073	76 53 51	3073
20	α Arietis	W.	44 25 24	3370	45 48 15	3352	47 11 26	3337	48 34 55	3323
	Pollux	E.	34 8 37	3163	32 41 43	3169	31 14 57	3177	29 48 20	3185
	Saturn	E.	61 31 4	3071	60 2 19	3069	58 33 32	3067	57 4 42	3065
	Regulus	E.	69 30 6	3067	68 1 16	3065	66 32 24	3064	65 3 30	3062

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object		Midnight.	P. L. of Diff.	XV^h.	P. L. of Diff.	XVIII^h.	P. L. of Diff.	XXI^h.	P. L. of Diff.
12	α Arietis	E.	49° 25′ 37″	3109	47° 57′ 38″	3133	46° 30′ 9″	3158	45° 3′ 10″	3185
	Aldebaran	E.	79 21 15	2840	77 47 39	2851	76 14 17	2861	74 41 8	2871
13	Sun	W.	128 43 39	3308	130 7 41	3318	131 31 32	3327	132 55 12	3336
	Venus	W.	96 32 33	3382	97 55 10	3392	99 17 36	3400	100 39 52	3409
	Mars	W.	74 45 21	3194	76 11 37	3203	77 37 43	3211	79 3 39	3220
	α Aquilæ	W.	67 23 23	3648	68 41 6	3641	69 58 56	3635	71 16 52	3630
	α Arietis	E.	37 56 50	3346	36 33 32	3387	35 11 1	3431	33 49 20	3481
	Aldebaran	E.	66 58 29	2917	65 26 32	2925	63 54 45	2933	62 23 8	2941
14	Venus	W.	107 28 54	3447	108 50 17	3454	110 11 32	3461	111 32 40	3467
	Mars	W.	86 11 0	3256	87 36 3	3263	89 0 58	3269	90 25 46	3275
	α Aquilæ	W.	77 47 37	3618	79 5 52	3617	80 24 8	3618	81 42 23	3619
	Fomalhaut	W.	42 48 32	3455	44 9 46	3436	45 31 22	3418	46 53 18	3402
	Aldebaran	E.	54 47 24	2976	53 16 41	2982	51 46 6	2988	50 15 38	2994
15	Mars	W.	97 28 7	3300	98 52 18	3306	100 16 23	3311	101 40 22	3315
	α Aquilæ	W.	88 13 13	3631	89 31 14	3635	90 49 10	3640	92 7 1	3646
	Fomalhaut	W.	53 46 45	3348	55 10 1	3340	56 33 26	3333	57 56 59	3328
	α Pegasi	W.	40 56 36	4012	42 8 4	3959	43 20 24	3913	44 33 31	3870
	Aldebaran	E.	42 45 4	3020	41 15 16	3025	39 45 34	3029	38 15 57	3034
	Pollux	E.	87 0 37	3046	85 31 21	3050	84 2 10	3054	82 33 4	3058
16	Fomalhaut	W.	64 56 13	3306	66 20 18	3302	67 44 27	3300	69 8 39	3297
	α Pegasi	W.	50 48 38	3711	52 5 13	3688	53 22 13	3667	54 39 35	3648
	Aldebaran	E.	30 49 13	3054	29 20 7	3057	27 51 5	3061	26 22 8	3065
	Pollux	E.	75 8 48	3077	73 40 10	3080	72 11 36	3083	70 43 6	3087
	Saturn	E.	102 54 47	3055	101 25 42	3057	99 56 40	3060	98 27 42	3063
17	Fomalhaut	W.	76 10 15	3288	77 34 40	3288	78 59 6	3287	80 23 33	3286
	α Pegasi	W.	61 11 13	3570	62 30 20	3558	63 49 40	3547	65 9 12	3537
	Pollux	E.	63 21 31	3101	61 53 22	3103	60 25 16	3105	58 57 13	3109
	Saturn	E.	91 3 32	3073	89 34 49	3073	88 6 7	3075	86 37 27	3076
	Regulus	E.	99 4 41	3067	97 35 51	3068	96 7 2	3069	94 38 15	3070
18	Fomalhaut	W.	87 25 59	3284	88 50 29	3284	90 14 59	3284	91 39 29	3284
	α Pegasi	W.	71 49 23	3497	73 9 50	3490	74 30 25	3485	75 51 6	3480
	Pollux	E.	51 37 45	3120	50 10 0	3123	48 42 18	3125	47 14 39	3128
	Saturn	E.	79 14 24	3079	77 45 49	3080	76 17 15	3080	74 48 41	3080
	Regulus	E.	87 14 37	3074	85 45 56	3075	84 17 16	3075	82 48 36	3074
19	Fomalhaut	W.	98 41 53	3287	100 6 20	3288	101 30 45	3289	102 55 9	3290
	α Pegasi	W.	82 35 51	3459	83 57 1	3455	85 18 15	3453	86 39 32	3450
	α Arietis	W.	38 57 47	3454	40 19 3	3430	41 40 46	3408	43 2 54	3388
	Pollux	E.	39 57 14	3143	38 29 57	3148	37 2 45	3152	35 35 38	3157
	Saturn	E.	67 25 44	3077	65 57 6	3076	64 28 27	3074	62 59 46	3073
	Regulus	E.	75 25 9	3073	73 56 25	3071	72 27 40	3070	70 58 54	3069
20	α Arietis	W.	49 58 40	3309	51 22 41	3296	52 46 57	3283	54 11 28	3271
	Pollux	E.	28 21 53	3196	26 55 39	3209	25 29 40	3224	24 3 59	3243
	Saturn	E.	55 35 50	3063	54 6 55	3060	52 37 56	3057	51 8 54	3054
	Regulus	E.	63 34 34	3060	62 5 35	3056	60 36 32	3054	59 7 26	3051

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	III^h.	P. L. of Diff.	VI^h.	P. L. of Diff.	IX^h.	P. L. of Diff.
21	α Arietis	W.	55° 36′ 13″	3260	57° 1′ 11″	3250	58° 26′ 21″	3239	59° 51′ 44″	3230
	Aldebaran	W.	22 40 43	3057	24 9 45	3052	25 38 54	3047	27 8 9	3041
	SATURN	E.	49 39 48	3051	48 10 38	3047	46 41 23	3043	45 12 4	3039
	Regulus	E.	57 38 16	3048	56 9 3	3044	54 39 45	3041	53 10 23	3037
22	α Arietis	W.	67 1 31	3182	68 28 2	3172	69 54 45	3163	71 21 39	3154
	Aldebaran	W.	34 36 5	3013	36 6 2	3007	37 36 6	3001	39 6 18	2993
	SATURN	E.	37 44 8	3015	36 14 14	3010	34 44 14	3005	33 14 7	2998
	Regulus	E.	45 42 16	3014	44 12 21	3009	42 42 20	3004	41 12 12	2998
	Spica	E.	99 38 58	3041	98 9 36	3035	96 40 7	3029	95 10 30	3022
23	α Arietis	W.	78 38 53	3107	80 6 54	3097	81 35 7	3088	83 3 31	3078
	Aldebaran	W.	46 39 31	2957	48 10 38	2948	49 41 56	2939	51 13 25	2931
	Regulus	E.	33 39 42	2967	32 8 48	2960	30 37 45	2953	29 6 33	2946
	Spica	E.	87 40 19	2986	86 9 49	2978	84 39 9	2970	83 8 19	2962
	SUN	E.	127 3 26	3347	125 40 9	3338	124 16 41	3327	122 53 1	3317
24	Aldebaran	W.	58 53 48	2881	60 26 31	2870	61 59 28	2859	63 32 40	2847
	Spica	E.	75 31 20	2915	73 59 20	2905	72 27 7	2894	70 54 40	2883
	SUN	E.	115 51 38	3262	114 26 42	3249	113 1 31	3237	111 36 6	3225
25	Aldebaran	W.	71 22 33	2784	72 57 22	2771	74 32 28	2756	76 7 53	2743
	Pollux	W.	27 50 6	2915	29 22 6	2889	30 54 39	2865	32 27 43	2841
	Spica	E.	63 8 53	2825	61 34 58	2814	60 0 48	2801	58 26 21	2788
	SUN	E.	104 25 3	3155	102 58 0	3140	101 30 39	3125	100 3 0	3110
26	Aldebaran	W.	84 9 47	2667	85 47 11	2652	87 24 56	2635	89 3 3	2618
	Pollux	W.	40 20 21	2735	41 56 15	2714	43 32 36	2694	45 9 24	2675
	Spica	E.	50 29 58	2724	48 53 50	2711	47 17 25	2699	45 40 44	2687
	SUN	E.	92 39 51	3027	91 10 12	3009	89 40 11	2992	88 9 48	2974
27	Aldebaran	W.	97 19 23	2533	98 59 50	2516	100 40 41	2498	102 21 57	2481
	Pollux	W.	53 20 1	2577	54 59 28	2557	56 39 22	2538	58 19 43	2519
	SATURN	W.	25 2 41	2541	26 42 57	2522	28 23 39	2504	30 4 47	2485
	Regulus	W.	17 18 29	2577	18 57 55	2552	20 37 56	2528	22 18 30	2506
	Spica	E.	37 33 10	2629	35 54 54	2620	34 16 26	2611	32 37 46	2604
	SUN	E.	80 32 13	2882	78 59 31	2863	77 26 25	2844	75 52 54	2825
28	Pollux	W.	66 48 10	2422	68 31 13	2403	70 14 43	2385	71 58 39	2366
	SATURN	W.	38 36 59	2393	40 20 44	2374	42 4 56	2356	43 49 34	2337
	Regulus	W.	30 48 47	2404	32 32 16	2384	34 16 14	2364	36 0 40	2346
	SUN	E.	67 59 2	2728	66 22 59	2708	64 46 30	2689	63 9 35	2670
29	Pollux	W.	80 45 1	2276	82 31 36	2259	84 18 36	2241	86 6 2	2225
	SATURN	W.	52 39 20	2248	54 26 36	2231	56 14 17	2214	58 2 23	2198
	Regulus	W.	44 49 35	2254	46 36 42	2237	48 24 15	2219	50 12 14	2202
	SUN	E.	54 58 39	2577	53 19 13	2559	51 39 22	2541	49 59 6	2524
30	Pollux	W.	95 9 11	2148	96 58 57	2134	98 49 5	2120	100 39 33	2108
	SATURN	W.	67 8 59	2120	68 59 28	2105	70 50 19	2092	72 41 30	2079
	Regulus	W.	59 18 18	2124	61 8 41	2109	62 59 26	2096	64 50 32	2083
	SUN	E.	41 32 0	2445	39 49 30	2431	38 6 40	2419	36 23 32	2406

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^h.	P. L. of Diff.	XVIII^h.	P. L. of Diff.	XXI^h.	P. L. of Diff.
21	α Arietis	W.	61° 17′ 18″	3220	62° 43′ 4″	3209	64° 9′ 2″	3200	65° 35′ 11″	3191
	Aldebaran	W.	28 37 31	3036	30 6 59	3030	31 36 34	3025	33 6 16	3019
	Saturn	E.	43 42 40	3035	42 13 11	3030	40 43 36	3026	39 13 55	3021
	Regulus	E.	51 40 56	3033	50 11 24	3029	48 41 47	3024	47 12 4	3020
22	α Arietis	W.	72 48 43	3144	74 15 59	3135	75 43 26	3126	77 11 4	3117
	Aldebaran	W.	40 36 39	2987	42 7 8	2980	43 37 46	2972	45 8 34	2965
	Saturn	E.	31 43 52	2993	30 13 30	2985	28 42 59	2979	27 12 20	2972
	Regulus	E.	39 41 57	2993	38 11 35	2986	36 41 5	2981	35 10 28	2973
	Spica	E.	93 40 45	3016	92 10 52	3009	90 40 50	3001	89 10 39	2994
23	α Arietis	W.	84 32 7	3069	86 0 55	3058	87 29 56	3048	88 59 9	3038
	Aldebaran	W.	52 45 5	2921	54 16 57	2912	55 49 1	2901	57 21 18	2891
	Regulus	E.	27 35 13	2939	26 3 44	2932	24 32 6	2925	23 0 19	2919
	Spica	E.	81 37 18	2953	80 6 6	2944	78 34 43	2935	77 3 8	2924
	Sun	E.	121 29 9	3306	120 5 5	3296	118 40 49	3285	117 16 20	3274
24	Aldebaran	W.	65 6 7	2835	66 39 49	2823	68 13 47	2810	69 48 2	2798
	Spica	E.	69 22 0	2873	67 49 6	2861	66 15 57	2849	64 42 33	2837
	Sun	E.	110 10 26	3211	108 44 30	3198	107 18 18	3183	105 51 49	3169
25	Aldebaran	W.	77 43 36	2729	79 19 38	2713	80 56 0	2698	82 32 43	2682
	Pollux	W.	34 1 18	2818	35 35 22	2797	37 9 54	2775	38 44 54	2755
	Spica	E.	56 51 38	2775	55 16 38	2763	53 41 22	2750	52 5 49	2737
	Sun	E.	98 35 2	3093	97 6 44	3078	95 38 6	3060	94 9 9	3044
26	Aldebaran	W.	90 41 33	2602	92 20 25	2585	93 59 41	2568	95 39 20	2551
	Pollux	W.	46 46 38	2655	48 24 19	2635	50 2 26	2615	51 41 0	2596
	Spica	E.	44 3 46	2674	42 26 31	2661	40 48 59	2650	39 11 12	2639
	Sun	E.	86 39 3	2956	85 7 55	2939	83 36 25	2920	82 4 31	2901
27	Aldebaran	W.	104 3 37	2462	105 45 43	2445	107 28 14	2426	109 11 11	2408
	Pollux	W.	60 0 30	2499	61 41 44	2480	63 23 25	2460	65 5 34	2441
	Saturn	W.	31 46 21	2467	33 28 21	2448	35 10 47	2429	36 53 40	2411
	Regulus	W.	23 59 35	2485	25 41 9	2464	27 23 13	2443	29 5 46	2424
	Spica	E.	30 58 57	2600	29 20 2	2598	27 41 4	2598	26 2 6	2602
	Sun	E.	74 18 58	2805	72 44 37	2786	71 9 51	2766	69 34 39	2747
28	Pollux	W.	73 43 2	2348	75 27 52	2329	77 13 9	2311	78 58 52	2294
	Saturn	W.	45 34 39	2320	47 20 10	2302	49 6 7	2284	50 52 30	2266
	Regulus	W.	37 45 33	2327	39 30 53	2309	41 16 40	2290	43 2 54	2272
	Sun	E.	61 32 15	2651	59 54 29	2632	58 16 18	2613	56 37 41	2595
29	Pollux	W.	87 53 52	2209	89 42 6	2192	91 30 45	2177	93 19 47	2163
	Saturn	W.	59 50 54	2181	61 39 50	2165	63 29 10	2150	65 18 53	2135
	Regulus	W.	52 0 38	2186	53 49 27	2170	55 38 40	2154	57 28 17	2138
	Sun	E.	48 18 26	2507	46 37 23	2491	44 55 57	2475	43 14 9	2460
30	Pollux	W.	102 30 20	2096	104 21 26	2084	106 12 50	2073	108 4 30	2063
	Saturn	W.	74 33 2	2066	76 24 54	2053	78 17 5	2043	80 9 34	2032
	Regulus	W.	66 41 58	2070	68 33 44	2057	70 25 49	2046	72 18 12	2035
	Sun	E.	34 40 6	2395	32 56 24	2384	31 12 26	2374	29 28 14	2366

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.	Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Subtracted from / Added to Apparent Time.	Diff. for 1 Hour.
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Sat.	1	16 32 29.06	10.822	S. 21 55 43.0	−22.58	16 16.08	70.36	10 34.44	0.964
SUN.	2	16 36 49.13	10.848	22 4 32.4	21.52	16 16.22	70.44	10 10.99	0.990
Mon.	3	16 41 9.82	10.873	22 12 56.3	20.45	16 16.36	70.52	9 46.93	1.014
Tues.	4	16 45 31.09	10.897	22 20 54.3	−19.37	16 16.50	70.59	9 22.28	1.038
Wed.	5	16 49 52.92	10.920	22 28 26.2	18.29	16 16.63	70.67	8 57.07	1.061
Thur.	6	16 54 15.27	10.941	22 35 31.8	17.19	16 16.76	70.74	8 31.35	1.082
Frid.	7	16 58 38.10	10.961	22 42 10.8	−16.08	16 16.89	70.81	8 5.15	1.102
Sat.	8	17 3 1.40	10.980	22 48 22.9	14.96	16 17.01	70.87	7 38.48	1.121
SUN.	9	17 7 25.14	10.997	22 54 8.1	13.83	16 17.13	70.93	7 11.37	1.138
Mon.	10	17 11 49.27	11.013	22 59 26.0	−12.68	16 17.25	70.99	6 43.87	1.154
Tues.	11	17 16 13.77	11.028	23 4 16.5	11.53	16 17.36	71.04	6 16.01	1.169
Wed.	12	17 20 38.61	11.041	23 8 39.5	10.38	16 17.47	71.09	5 47.81	1.182
Thur.	13	17 25 3.76	11.053	23 12 34.8	− 9.23	16 17.57	71.13	5 19.29	1.194
Frid.	14	17 29 29.20	11.064	23 16 2.3	8.07	16 17.67	71.17	4 50.49	1.205
Sat.	15	17 33 54.88	11.074	23 19 1.8	6.91	16 17.76	71.20	4 21.45	1.215
SUN.	16	17 38 20.77	11.082	23 21 33.4	− 5.74	16 17.84	71.23	3 52.20	1.223
Mon.	17	17 42 46.84	11.090	23 23 36.9	4.57	16 17.92	71.25	3 22.76	1.230
Tues.	18	17 47 13.08	11.096	23 25 12.2	3.38	16 17.99	71.27	2 53.16	1.236
Wed.	19	17 51 39.45	11.101	23 26 19.3	− 2.21	16 18.06	71.28	2 23.43	1.241
Thur.	20	17 56 5.91	11.104	23 26 58.1	− 1.03	16 18.12	71.29	1 53.61	1.244
Frid.	21	18 0 32.44	11.107	23 27 8.7	+ 0.15	16 18.17	71.30	1 23.72	1.247
Sat.	22	18 4 59.02	11.108	23 26 51.1	+ 1.33	16 18.22	71.30	0 53.78	1.248
SUN.	23	18 9 25.61	11.108	23 26 5.1	2.50	16 18.26	71.30	0 23.82	1.248
Mon.	24	18 13 52.17	11.106	23 24 50.8	3.68	16 18.29	71.29	0 6.10	1.246
Tues.	25	18 18 18.67	11.103	23 23 8.3	+ 4.85	16 18.32	71.28	0 35.96	1.243
Wed.	26	18 22 45.08	11.098	23 20 57.6	6.03	16 18.35	71.26	1 5.73	1.238
Thur.	27	18 27 11.37	11.092	23 18 18.7	7.20	16 18.37	71.24	1 35.38	1.232
Frid.	28	18 31 37.50	11.085	23 15 11.8	+ 8.37	16 18.38	71.21	2 4.87	1.225
Sat.	29	18 36 3.43	11.076	23 11 36.9	9.53	16 18.39	71.18	2 34.16	1.216
SUN.	30	18 40 29.13	11.066	23 7 34.1	10.69	16 18.40	71.15	3 3.22	1.206
Mon.	31	18 44 54.57	11.054	23 3 3.5	11.85	16 18.40	71.11	3 32.02	1.194
Tues.	32	18 49 19.71	11.040	S. 22 58 5.2	+13.00	16 18.40	71.06	4 0.52	1.180

NOTE.—The mean time of semidiameter passing may be found by subtracting 0s.19 from the sidereal time. The sign − prefixed to the hourly change of declination indicates that south declinations are increasing; the sign + indicates that south declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	Diff. for 1 Hour.	THE SUN'S Apparent Declination.	Diff. for 1 Hour.	Equation of Time, to be Added to / Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	s	m s	s	h m s
Sat.	1	16 32 30.97	10.820	S. 21 55 47.0	−22.57	10 34.27	0.964	16 43 5.24
SUN.	2	16 36 50.98	10.846	22 4 36.1	21.51	10 10.82	0.990	16 47 1.80
Mon.	3	16 41 11.59	10.870	22 12 59.6	20.44	9 46.76	1.014	16 50 58.35
Tues.	4	16 45 32.79	10.894	22 20 57.3	−19.36	9 22.12	1.038	16 54 54.91
Wed.	5	16 49 54.55	10.917	22 28 28.9	18.28	8 56.91	1.061	16 58 51.46
Thur.	6	16 54 16.82	10.938	22 35 34.2	17.18	8 31.20	1.082	17 2 48.02
Frid.	7	16 58 39.58	10.958	22 42 12.9	−16.07	8 5.00	1.102	17 6 44.58
Sat.	8	17 3 2.80	10.977	22 48 24.8	14.95	7 38.34	1.121	17 10 41.14
SUN.	9	17 7 26.46	10.994	22 54 9.7	13.82	7 11.23	1.138	17 14 37.69
Mon.	10	17 11 50.51	11.010	22 59 27.4	−12.67	6 43.74	1.154	17 18 34.25
Tues.	11	17 16 14.93	11.025	23 4 17.7	11.52	6 15.88	1.169	17 22 30.81
Wed.	12	17 20 39.68	11.038	23 8 40.5	10.37	5 47.69	1.182	17 26 27.37
Thur.	13	17 25 4.75	11.050	23 12 35.6	− 9.22	5 19.18	1.194	17 30 23.93
Frid.	14	17 29 30.09	11.061	23 16 2.9	8.06	4 50.39	1.205	17 34 20.49
Sat.	15	17 33 55.68	11.071	23 19 2.3	6.90	4 21.36	1.215	17 38 17.04
SUN.	16	17 38 21.48	11.079	23 21 33.8	− 5.73	3 52.12	1.223	17 42 13.60
Mon.	17	17 42 47.46	11.086	23 23 37.2	4.56	3 22.69	1.230	17 46 10.15
Tues.	18	17 47 13.61	11.092	23 25 12.4	3.38	2 53.10	1.236	17 50 6.71
Wed.	19	17 51 39.89	11.097	23 26 19.4	− 2.21	2 23.38	1.241	17 54 3.27
Thur.	20	17 56 6.26	11.100	23 26 58.2	− 1.03	1 53.57	1.244	17 57 59.83
Frid.	21	18 0 32.70	11.103	23 27 8.8	+ 0.15	1 23.69	1.247	18 1 56.39
Sat.	22	18 4 59.19	11.104	23 26 51.1	+ 1.33	0 53.76	1.248	18 5 52.95
SUN.	23	18 9 25.69	11.104	23 26 5.1	2.50	0 23.81	1.248	18 9 49.50
Mon.	24	18 13 52.16	11.102	23 24 50.8	3.68	0 6.10	1.246	18 13 46.06
Tues.	25	18 18 18.57	11.099	23 23 8.4	+ 4.85	0 35.95	1.243	18 17 42.62
Wed.	26	18 22 44.88	11.094	23 20 57.7	6.03	1 5.71	1.238	18 21 39.18
Thur.	27	18 27 11.08	11.088	23 18 18.9	7.20	1 35.35	1.232	18 25 35.73
Frid.	28	18 31 37.12	11.081	23 15 12.1	+ 8.37	2 4.83	1.225	18 29 32.29
Sat.	29	18 36 2.96	11.072	23 11 37.3	9.53	2 34.11	1.216	18 33 28.85
SUN.	30	18 40 28.57	11.062	23 7 34.6	10.69	3 3.16	1.206	18 37 25.41
Mon.	31	18 44 53.92	11.050	23 3 4.1	11.84	3 31.95	1.194	18 41 21.96
Tues.	32	18 49 18.97	11.036	S. 22 58 6.0	+12.99	3 0.45	1.180	18 45 18 52

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign − prefixed to the hourly change of declination indicates that south declinations are increasing; the sign + indicates that south declinations are decreasing.

Diff. for 1 Hour, + 9s.8565. (Table III.)

Day of the Month.	Day of the Year.	AT GREENWICH MEAN NOON: THE SUN'S TRUE LONGITUDE. λ	λ'	Diff. for 1 Hour.	LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		° ′ ″	′ ″	″	″			h m s
1	336	249 47 22.6	46 53.3	152.24	+ 0.61	9.9936925	−27.0	7 15 43.18
2	337	250 48 17.1	47 47.7	152.29	0.54	9.9936285	26.4	7 11 47.27
3	338	251 49 12.8	48 43.2	152.34	0.45	9.9935658	25.8	7 7 51.36
4	339	252 50 9.5	49 39.8	152.38	+ 0.34	9.9935046	−25.2	7 3 55.45
5	340	253 51 7.2	50 37.3	152.42	0.21	9.9934447	24.6	6 59 59.54
6	341	254 52 5.8	51 35.7	152.45	+ 0.08	9.9933862	24.0	6 56 3.63
7	342	255 53 5.0	52 34.8	152.48	− 0.05	9.9933293	−23.4	6 52 7.72
8	343	256 54 4.9	53 34.6	152.51	0.17	9.9932740	22.7	6 48 11.81
9	344	257 55 5.5	54 35.0	152.54	0.29	9.9932204	21.9	6 44 15.89
10	345	258 56 6.7	55 36.0	152.56	− 0.39	9.9931687	−21.1	6 40 19.98
11	346	259 57 8.4	56 37.6	152.58	0.46	9.9931191	20.2	6 36 24.07
12	347	260 58 10.6	57 39.6	152.60	0.50	9.9930716	19.3	6 32 28.16
13	348	261 59 13.2	58 42.0	152.62	− 0.51	9.9930265	−18.3	6 28 32.24
14	349	262 60 16.2	59 44.8	152.64	0.49	9.9929839	17.2	6 24 36.33
15	350	264 1 19.7	0 48.1	152.66	0.44	9.9929439	16.1	6 20 40.42
16	351	265 2 23.6	1 51.8	152.67	− 0.36	9.9929065	−15.0	6 16 44.51
17	352	266 3 28.0	2 56.1	152.69	0.26	9.9928718	13.9	6 12 48.59
18	353	267 4 32.9	4 0.8	152.71	0.14	9 9928399	12.7	6 8 52.68
19	354	268 5 38.3	5 6.0	152.73	− 0.01	9.9928108	−11.6	6 4 56.77
20	355	269 6 44.3	6 11.8	152.76	+ 0.12	9.9927846	10.4	6 1 0.86
21	356	270 7 50.9	7 18.3	152.78	0.25	9.9927611	9.3	5 57 4.95
22	357	271 8 58.1	8 25.3	152.81	+ 0.36	9.9927403	− 8.1	5 53 9.04
23	358	272 10 5.8	9 32.8	152.84	0.47	9.9927221	7.0	5 49 13.13
24	359	273 11 14.1	10 40.9	152.86	0.55	9.9927064	6.0	5 45 17.22
25	360	274 12 23.1	11 49.7	152.88	+ 0.61	9.9926932	− 5.0	5 41 21.30
26	361	275 13 32.6	12 59.0	152.90	0.64	9.9926823	4.1	5 37 25.39
27	362	276 14 42.5	14 8.8	152.92	0.63	9.9926735	3.2	5 33 29.48
28	363	277 15 52.9	15 19.1	152.94	+ 0.60	9.9926667	− 2.4	5 29 33.57
29	364	278 17 3.7	16 29.7	152.96	0.54	9.9926618	1.6	5 25 37.65
30	365	279 18 14 8	17 40.6	152.97	0.45	9.9926588	0.9	5 21 41.74
31	366	280 19 26.2	18 51.8	152.97	0.34	9.9926576	− 0.2	5 17 45.83
32	367	281 20 37.7	20 3.2	152.98	+ 0.22	9.9926581	+ 0.5	5 13 49.92

NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ', to the mean equinox of January $0^d.0$.

Diff. for 1 Hour, $-9^s.8296$. (Table II.)

GREENWICH MEAN TIME

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	16 38.9	16 42.6	60 59.3	+1.31	61 13.0	+0.95	22 55.9	2.47	27.5
2	16 45.1	16 46.2	61 22.1	+0.55	61 26.2	+0.13	23 56.7	2.59	28.5
3	16 45.9	16 44.2	61 25.1	−0.31	61 18.8	−0.73	♂		0.1
4	16 41.1	16 36.8	61 7.6	−1.13	60 51.8	−1.49	0 59.7	2.67	1.1
5	16 31.4	16 25.1	60 31.9	1.80	60 8.7	2.04	2 2.9	2.60	2.1
6	16 18.1	16 10.5	59 42.9	2.23	59 15.2	2.36	3 4.0	2.47	3.1
7	16 2.7	15 54.7	58 46.3	−2.43	58 16.9	−2.44	4 1.3	2.30	4.1
8	15 46.7	15 39.0	57 47.7	2.41	57 19.2	2.33	4 54.3	2.11	5.1
9	15 31.5	15 24.5	56 51.9	2.21	56 26.1	2.07	5 43.3	1.96	6.1
10	15 18.0	15 12.0	56 2.1	−1.92	55 40.1	−1.75	6 29.0	1.86	7.1
11	15 6.6	15 1.8	55 20.2	1.56	55 2.6	1.37	7 12.5	1.78	8.1
12	14 57.6	14 54.0	54 47.3	1.18	54 34.2	1.00	7 54.8	1.75	9.1
13	14 51.0	14 48.6	54 23.2	−0.83	54 14.4	−0.65	8 36.8	1.77	10.1
14	14 46.8	14 45.5	54 7.6	0.48	54 2.8	0.33	9 19.4	1.80	11.1
15	14 44.6	14 44.3	53 59.7	−0.19	53 58.3	−0.05	10 3.1	1.86	12.1
16	14 44.3	14 44.7	53 58.4	+0.07	54 0.0	+0.19	10 48.5	1.93	13.1
17	14 45.5	14 46.7	54 3.0	0.30	54 7.2	0.40	11 35.7	2.00	14.1
18	14 48.1	14 49.9	54 12.6	0.50	54 19.1	0.59	12 24.4	2.06	15.1
19	14 52.0	14 54.4	54 26.7	+0.68	54 35.4	+0.77	13 14.1	2.08	16.1
20	14 57.0	15 0.0	54 45.2	0.86	54 56.1	0.96	14 4.1	2.08	17.1
21	15 3.3	15 6.9	55 8.2	1.06	55 21.4	1.15	14 53.8	2.05	18.1
22	15 10.8	15 15.1	55 35.8	+1.26	55 51.5	+1.36	15 42.7	2.01	19.1
23	15 19.7	15 24.6	56 8.4	1.46	56 26.5	1.56	16 30.7	1.98	20.1
24	15 29.9	15 35.5	56 45.9	1.66	57 6.4	1.75	17 18.2	1.97	21.1
25	15 41.3	15 47.4	57 27.9	+1.83	57 50.3	+1.89	18 5.8	2.00	22.1
26	15 53.7	16 0.0	58 13.3	1.93	58 36.5	1.94	18 54.4	2.06	23.1
27	16 6.3	16 12.5	58 59.7	1.91	59 22.3	1.84	19 45.1	2.18	24.1
28	16 18.4	16 23.8	59 43.9	+1.73	60 3.8	+1.57	20 38.8	2.31	25.1
29	16 28.6	16 32.6	60 21.5	1.36	60 36.4	1.10	21 36.1	2.47	26.1
30	16 35.8	16 37.8	60 47.9	0.80	60 55.5	+0.46	22 36.9	2.60	27.1
31	16 38.8	16 38.5	60 58.9	+0.10	60 57.9	−0.28	23 39.9	2.65	28.1
32	16 36.9	16 34.2	60 52.2	−0.66	60 42.0	−1.03	♂		29.1

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY 1.			
	h m s	s	° ′ ″	″
0	14 45 59.05	2.4139	S. 10 58 24.6	12.382
1	14 48 24.04	2.4192	11 10 45.7	12.320
2	14 50 49.35	2.4245	11 23 3.0	12.257
3	14 53 14.98	2.4298	11 35 16.5	12.191
4	14 55 40.93	2.4351	11 47 25.9	12.122
5	14 58 7.19	2.4404	11 59 31.2	12.053
6	15 0 33.77	2.4457	12 11 32.3	11.982
7	15 3 0.67	2.4511	12 23 29.0	11.908
8	15 5 27.90	2.4565	12 35 21.3	11.833
9	15 7 55.45	2.4618	12 47 9.0	11.756
10	15 10 23.31	2.4671	12 58 52.0	11.677
11	15 12 51.50	2.4725	13 10 30.2	11.597
12	15 15 20.01	2.4778	13 22 3.6	11.514
13	15 17 48.84	2.4832	13 33 31.9	11.429
14	15 20 17.99	2.4885	13 44 55.1	11.342
15	15 22 47.46	2.4938	13 56 13.0	11.254
16	15 25 17.25	2.4991	14 7 25.6	11.165
17	15 27 47.36	2.5044	14 18 32.8	11.073
18	15 30 17.78	2.5097	14 29 34.4	10.979
19	15 32 48.52	2.5150	14 40 30.3	10.883
20	15 35 19.58	2.5202	14 51 20.4	10.786
21	15 37 50.95	2.5254	15 2 4.7	10.687
22	15 40 22.63	2.5306	15 12 42.9	10.586
23	15 42 54.62	2.5358	S. 15 23 15.0	10.483
	SUNDAY 2.			
0	15 45 26.93	2.5410	S. 15 33 40.9	10.379
1	15 47 59.54	2.5460	15 44 0.5	10.272
2	15 50 32.45	2.5511	15 54 13.6	10.164
3	15 53 5.67	2.5561	16 4 20.2	10.054
4	15 55 39.19	2.5611	16 14 20.1	9.943
5	15 58 13.00	2.5660	16 24 13.3	9.830
6	16 0 47.11	2.5709	16 33 59.7	9.715
7	16 3 21.51	2.5757	16 43 39.1	9.598
8	16 5 56.19	2.5804	16 53 11.4	9.479
9	16 8 31.16	2.5851	17 2 36.6	9.359
10	16 11 6.41	2.5898	17 11 54.5	9.238
11	16 13 41.94	2.5945	17 21 5.1	9.115
12	16 16 17.75	2.5991	17 30 8.3	8.990
13	16 18 53.83	2.6035	17 39 3.9	8.863
14	16 21 30.17	2.6078	17 47 51.9	8.735
15	16 24 6.77	2.6121	17 56 32.1	8.605
16	16 26 43.63	2.6164	18 5 4.5	8.474
17	16 29 20.74	2.6205	18 13 29.0	8.342
18	16 31 58.09	2.6245	18 21 45.5	8.208
19	16 34 35.68	2.6285	18 29 53.9	8.072
20	16 37 13.51	2.6325	18 37 54.1	7.935
21	16 39 51.58	2.6364	18 45 46.1	7.797
22	16 42 29.88	2.6402	18 53 29.8	7.657
23	16 45 8.40	2.6437	19 1 5.0	7.516
24	16 47 47.13	2.6472	S. 19 8 31.7	7.373
	MONDAY 3.			
0	16 47 47.13	2.6472	S. 19 8 31.7	7.373
1	16 50 26.07	2.6507	19 15 49.8	7.230
2	16 53 5.21	2.6540	19 22 59.3	7.085
3	16 55 44.55	2.6572	19 30 0.0	6.939
4	16 58 24.08	2.6604	19 36 51.9	6.792
5	17 1 3.80	2.6634	19 43 35.0	6.643
6	17 3 43.69	2.6663	19 50 9.1	6.493
7	17 6 23.75	2.6691	19 56 34.2	6.343
8	17 9 3.98	2.6717	20 2 50.3	6.192
9	17 11 44.36	2.6742	20 8 57.3	6.039
10	17 14 24.89	2.6767	20 14 55.0	5.884
11	17 17 5.57	2.6791	20 20 43.4	5.729
12	17 19 46.38	2.6812	20 26 22.5	5.574
13	17 22 27.31	2.6832	20 31 52.3	5.418
14	17 25 8.36	2.6852	20 37 12.7	5.261
15	17 27 49.53	2.6870	20 42 23.6	5.102
16	17 30 30.80	2.6887	20 47 25.0	4.943
17	17 33 12.17	2.6902	20 52 16.8	4.784
18	17 35 53.62	2.6915	20 56 59.1	4.625
19	17 38 35.15	2.6927	21 1 31.8	4.464
20	17 41 16.75	2.6939	21 5 54.8	4.302
21	17 43 58.42	2.6949	21 10 8.1	4.140
22	17 46 40.14	2.6957	21 14 11.6	3.977
23	17 49 21.91	2.6964	S. 21 18 5.3	3.813
	TUESDAY 4.			
0	17 52 3.71	2.6969	S. 21 21 49.2	3.650
1	17 54 45.54	2.6973	21 25 23.3	3.487
2	17 57 27.39	2.6976	21 28 47.6	3.323
3	18 0 9.26	2.6977	21 32 2.1	3.159
4	18 2 51.12	2.6977	21 35 6.7	2.994
5	18 5 32.98	2.6975	21 38 1.4	2.829
6	18 8 14.82	2.6972	21 40 46.2	2.664
7	18 10 56.64	2.6967	21 43 21.1	2.499
8	18 13 38.42	2.6960	21 45 46.1	2.334
9	18 16 20.16	2.6952	21 48 1.2	2.168
10	18 19 1.85	2.6943	21 50 6.3	2.002
11	18 21 43.48	2.6933	21 52 1.5	1.837
12	18 24 25.05	2.6922	21 53 46.8	1.672
13	18 27 6.54	2.6908	21 55 22.2	1.507
14	18 29 47.94	2.6892	21 56 47.6	1.341
15	18 32 29.24	2.6875	21 58 3.1	1.177
16	18 35 10.44	2.6857	21 59 8.8	1.012
17	18 37 51.53	2.6837	22 0 4.6	0.847
18	18 40 32.49	2.6816	22 0 50.5	0.683
19	18 43 13.32	2.6794	22 1 26.6	0.520
20	18 45 54.02	2.6771	22 1 52.9	0.357
21	18 48 34.57	2.6746	22 2 9.4	0.194
22	18 51 14.97	2.6719	22 2 16.1	− 0.031
23	18 53 55.20	2.6691	22 2 13.1	+ 0.131
24	18 56 35.26	2.6662	S. 22 2 0.4	0.292

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 5.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute
	h m s	s	° ′ ″	″
0	18 56 35.26	2.6662	S. 22 2 0.4	0.292
1	18 59 15.14	2.6631	22 1 38.0	0.453
2	19 1 54.83	2.6599	22 1 6.0	0.613
3	19 4 34.33	2.6566	22 0 24.4	0.773
4	19 7 13.62	2.6531	21 59 33.2	0.932
5	19 9 52.70	2.6495	21 58 32.5	1.091
6	19 12 31.56	2.6457	21 57 22.3	1.248
7	19 15 10.19	2.6419	21 56 2.7	1.405
8	19 17 48.59	2.6380	21 54 33.7	1.561
9	19 20 26.75	2.6339	21 52 55.4	1.716
10	19 23 4.66	2.6297	21 51 7.8	1.871
11	19 25 42.32	2.6254	21 49 10.9	2.024
12	19 28 19.71	2.6209	21 47 4.9	2.176
13	19 30 56.83	2.6164	21 44 49.8	2.327
14	19 33 33.68	2.6117	21 42 25.6	2.478
15	19 36 10.24	2.6069	21 39 52.4	2.628
16	19 38 46.51	2.6021	21 37 10.2	2.777
17	19 41 22.49	2.5972	21 34 19.1	2.925
18	19 43 58.17	2.5921	21 31 19.2	3.072
19	19 46 33.54	2.5869	21 28 10.5	3.217
20	19 49 8.60	2.5816	21 24 53.2	3.360
21	19 51 43.33	2.5761	21 21 27.3	3.503
22	19 54 17.73	2.5707	21 17 52.9	3.645
23	19 56 51.81	2.5652	S. 21 14 9.9	3.787

THURSDAY 6.

0	19 59 25.56	2.5597	S. 21 10 18.5	3.926
1	20 1 58.97	2.5539	21 6 18.8	4.064
2	20 4 32.03	2.5481	21 2 10.8	4.202
3	20 7 4.74	2.5422	20 57 54.6	4.338
4	20 9 37.09	2.5363	20 53 30.3	4.472
5	20 12 9.09	2.5303	20 48 58.0	4.605
6	20 14 40.73	2.5242	20 44 17.7	4.737
7	20 17 12.00	2.5181	20 39 29.5	4.868
8	20 19 42.90	2.5119	20 34 33.5	4.998
9	20 22 13.43	2.5057	20 29 29.8	5.126
10	20 24 43.58	2.4993	20 24 18.4	5.253
11	20 27 13.35	2.4930	20 18 59.5	5.378
12	20 29 42.74	2.4866	20 13 33.1	5.502
13	20 32 11.74	2.4801	20 7 59.3	5.624
14	20 34 40.35	2.4736	20 2 18.2	5.746
15	20 37 8.57	2.4671	19 56 29.8	5.866
16	20 39 36.40	2.4605	19 50 34.3	5.984
17	20 42 3.83	2.4538	19 44 31.7	6.101
18	20 44 30.86	2.4472	19 38 22.2	6.216
19	20 46 57.49	2.4405	19 32 5.8	6.331
20	20 49 23.72	2.4338	19 25 42.5	6.444
21	20 51 49.55	2.4271	19 19 12.5	6.556
22	20 54 14.97	2.4203	19 12 35.8	6.666
23	20 56 39.98	2.4135	19 5 52.6	6.773
24	20 59 4.59	2.4067	S. 18 59 3.0	6.880

FRIDAY 7.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute
	h m s	s	° ′ ″	″
0	20 59 4.59	2.4067	S. 18 59 3.0	6.880
1	21 1 28.78	2.3999	18 52 7.0	6.987
2	21 3 52.57	2.3931	18 45 4.6	7.092
3	21 6 15.95	2.3862	18 37 56.0	7.194
4	21 8 38.92	2.3793	18 30 41.3	7.295
5	21 11 1.47	2.3724	18 23 20.6	7.395
6	21 13 23.61	2.3656	18 15 53.9	7.494
7	21 15 45.34	2.3587	18 8 21.3	7.592
8	21 18 6.66	2.3519	18 0 42.9	7.687
9	21 20 27.57	2.3451	17 52 58.9	7.780
10	21 22 48.07	2.3382	17 45 9.3	7.873
11	21 25 8.15	2.3313	17 37 14.1	7.966
12	21 27 27.82	2.3244	17 29 13.4	8.056
13	21 29 47.08	2.3176	17 21 7.4	8.144
14	21 32 5.93	2.3108	17 12 56.1	8.232
15	21 34 24.38	2.3041	17 4 39.6	8.318
16	21 36 42.42	2.2973	16 56 18.0	8.402
17	21 39 0.05	2.2904	16 47 51.4	8.485
18	21 41 17.27	2.2837	16 39 19.8	8.567
19	21 43 34.09	2.2770	16 30 43.4	8.647
20	21 45 50.51	2.2702	16 22 2.2	8.727
21	21 48 6.52	2.2635	16 13 16.2	8.805
22	21 50 22.13	2.2569	16 4 25.6	8.881
23	21 52 37.35	2.2504	S. 15 55 30.5	8.956

SATURDAY 8.

0	21 54 52.18	2.2438	S. 15 46 30.9	9.030
1	21 57 6.61	2.2372	15 37 26.9	9.102
2	21 59 20.65	2.2307	15 28 18.6	9.172
3	22 1 34.30	2.2242	15 19 6.2	9.242
4	22 3 47.56	2.2177	15 9 49.6	9.311
5	22 6 0.43	2.2112	15 0 28.9	9.378
6	22 8 12.91	2.2049	14 51 4.2	9.444
7	22 10 25.01	2.1986	14 41 35.6	9.509
8	22 12 36.74	2.1924	14 32 3.1	9.572
9	22 14 48.10	2.1861	14 22 26.9	9.634
10	22 16 59.08	2.1798	14 12 47.0	9.695
11	22 19 9.68	2.1736	14 3 3.5	9.755
12	22 21 19.91	2.1675	13 53 16.4	9.814
13	22 23 29.78	2.1615	13 43 25.8	9.872
14	22 25 39.29	2.1555	13 33 31.8	9.927
15	22 27 48.44	2.1496	13 23 34.6	9.981
16	22 29 57.24	2.1437	13 13 34.1	10.035
17	22 32 5.68	2.1378	13 3 30.4	10.087
18	22 34 13.77	2.1319	12 53 23.6	10.139
19	22 36 21.51	2.1262	12 43 13.7	10.189
20	22 38 28.91	2.1205	12 33 0.9	10.238
21	22 40 35.97	2.1148	12 22 45.2	10.286
22	22 42 42.69	2.1092	12 12 26.6	10.333
23	22 44 49.08	2.1036	12 2 5.2	10.379
24	22 46 55.13	2.0981	S. 11 51 41.1	10.423

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SUNDAY 9.			
	h m s	s	° ′ ″	″
0	22 46 55.13	2.0981	S. 11 51 41.1	10.423
1	22 49 0.85	2.0927	11 41 14.4	10.467
2	22 51 6.25	2.0874	11 30 45.1	10.510
3	22 53 11.34	2.0822	11 20 13.2	10.552
4	22 55 16.11	2.0769	11 9 38.9	10.592
5	22 57 20.57	2.0717	10 59 2.2	10.631
6	22 59 24.71	2.0665	10 48 23.2	10.669
7	23 1 28.55	2.0615	10 37 42.0	10.706
8	23 3 32.09	2.0565	10 26 58.5	10.742
9	23 5 35.33	2.0515	10 16 12.9	10.777
10	23 7 38.27	2.0466	10 5 25.2	10.812
11	23 9 40.92	2.0417	9 54 35.5	10.845
12	23 11 43.28	2.0370	9 43 43.8	10.878
13	23 13 45.36	2.0323	9 32 50.1	10.910
14	23 15 47.16	2.0277	9 21 54.6	10.939
15	23 17 48.68	2.0231	9 10 57.4	10.968
16	23 19 49.93	2.0186	8 59 58.5	10.996
17	23 21 50.91	2.0142	8 48 57.9	11.023
18	23 23 51.63	2.0098	8 37 55.7	11.050
19	23 25 52.09	2.0055	8 26 51.9	11.076
20	23 27 52.29	2.0012	8 15 46.6	11.101
21	23 29 52.23	1.9969	8 4 39.8	11.125
22	23 31 51.92	1.9928	7 53 31.6	11.148
23	23 33 51.37	1.9889	S. 7 42 22.0	11.170
	MONDAY 10.			
0	23 35 50.59	1.9850	S. 7 31 11.2	11.191
1	23 37 49.57	1.9810	7 19 59.1	11.212
2	23 39 48.31	1.9771	7 8 45.8	11.231
3	23 41 46.82	1.9732	6 57 31.4	11.249
4	23 43 45.10	1.9695	6 46 15.9	11.267
5	23 45 43.16	1.9659	6 34 59.4	11.284
6	23 47 41.01	1.9624	6 23 41.8	11.301
7	23 49 38.65	1.9588	6 12 23.2	11.317
8	23 51 36.07	1.9553	6 1 3.8	11.330
9	23 53 33.28	1.9519	5 49 43.6	11.343
10	23 55 30.29	1.9486	5 38 22.6	11.356
11	23 57 27.11	1.9453	5 27 0.8	11.369
12	23 59 23.73	1.9421	5 15 38.3	11.381
13	0 1 20.16	1.9390	5 4 15.1	11.392
14	0 3 16.41	1.9360	4 52 51.3	11.401
15	0 5 12.48	1.9330	4 41 27.0	11.410
16	0 7 8.37	1.9300	4 30 2.1	11.418
17	0 9 4.08	1.9271	4 18 36.8	11.426
18	0 10 59.62	1.9243	4 7 11.0	11.433
19	0 12 55.00	1.9216	3 55 44.8	11.439
20	0 14 50.22	1.9190	3 44 18.3	11.444
21	0 16 45.28	1.9163	3 32 51.5	11.448
22	0 18 40.18	1.9137	3 21 24.5	11.452
23	0 20 34.93	1.9112	3 9 57.2	11.456
24	0 22 29.53	1.9089	S. 2 58 29.7	11.459

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	TUESDAY 11.			
	h m s	s	° ′ ″	″
0	0 22 29.53	1.9089	S. 2 58 29.7	11.459
1	0 24 23.99	1.9066	2 47 2.1	11.460
2	0 26 18.32	1.9043	2 35 34.5	11.461
3	0 28 12.51	1.9021	2 24 6.8	11.462
4	0 30 6.57	1.8999	2 12 39.1	11.462
5	0 32 0.50	1.8978	2 1 11.4	11.461
6	0 33 54.31	1.8958	1 49 43.8	11.459
7	0 35 48.00	1.8938	1 38 16.4	11.456
8	0 37 41.57	1.8919	1 26 49.1	11.453
9	0 39 35.03	1.8901	1 15 22.0	11.449
10	0 41 28.38	1.8883	1 3 55.2	11.445
11	0 43 21.63	1.8866	0 52 28.6	11.441
12	0 45 14.78	1.8850	0 41 2.3	11.435
13	0 47 7.83	1.8834	0 29 36.4	11.428
14	0 49 0.79	1.8819	0 18 10.9	11.421
15	0 50 53.66	1.8805	S. 0 6 45.9	11.414
16	0 52 46.45	1.8791	N. 0 4 38.7	11.406
17	0 54 39.15	1.8777	0 16 2.8	11.397
18	0 56 31.77	1.8764	0 27 26.3	11.387
19	0 58 24.32	1.8752	0 38 49.2	11.377
20	1 0 16.80	1.8741	0 50 11.5	11.367
21	1 2 9.21	1.8729	1 1 33.2	11.355
22	1 4 1.55	1.8719	1 12 54.1	11.342
23	1 5 53.84	1.8710	N. 1 24 14.3	11.330
	WEDNESDAY 12.			
0	1 7 46.07	1.8701	N. 1 35 33.7	11.317
1	1 9 38.25	1.8692	1 46 52.3	11.302
2	1 11 30.38	1.8684	1 58 10.0	11.287
3	1 13 22.46	1.8677	2 9 26.8	11.272
4	1 15 14.50	1.8670	2 20 42.7	11.257
5	1 17 6.50	1.8664	2 31 57.6	11.241
6	1 18 58.47	1.8659	2 43 11.6	11.224
7	1 20 50.41	1.8654	2 54 24.5	11.206
8	1 22 42.32	1.8649	3 5 36.3	11.187
9	1 24 34.20	1.8645	3 16 47.0	11.168
10	1 26 26.06	1.8642	3 27 56.5	11.149
11	1 28 17.91	1.8640	3 39 4.9	11.130
12	1 30 9.74	1.8638	3 50 12.1	11.109
13	1 32 1.56	1.8636	4 1 18.0	11.087
14	1 33 53.37	1.8635	4 12 22.6	11.065
15	1 35 45.18	1.8635	4 23 25.8	11.042
16	1 37 36.99	1.8635	4 34 27.7	11.020
17	1 39 28.80	1.8635	4 45 28.2	10.997
18	1 41 20.61	1.8636	4 56 27.3	10.972
19	1 43 12.43	1.8638	5 7 24.9	10.947
20	1 45 4.27	1.8641	5 18 21.0	10.922
21	1 46 56.12	1.8644	5 29 15.5	10.896
22	1 48 47.99	1.8647	5 40 8.5	10.869
23	1 50 39.88	1.8650	5 50 59.8	10.842
24	1 52 31.79	1.8654	N. 6 1 49.5	10.814

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	THURSDAY 13.			
	h m s	s	° ′ ″	″
0	1 52 31.79	1.8654	N. 6 1 49.5	10.814
1	1 54 23.73	1.8659	6 12 37.5	10.786
2	1 56 15.70	1.8665	6 23 23.8	10.757
3	1 58 7.71	1.8671	6 34 8.3	10.727
4	1 59 59.75	1.8678	6 44 51.0	10.697
5	2 1 51.84	1.8685	6 55 31.9	10.667
6	2 3 43.97	1.8692	7 6 11.0	10.636
7	2 5 36.14	1.8699	7 16 48.2	10.603
8	2 7 28.36	1.8708	7 27 23.4	10.570
9	2 9 20.64	1.8717	7 37 56.6	10.537
10	2 11 12.97	1.8727	7 48 27.8	10.502
11	2 13 5.36	1.8737	7 58 56.9	10.467
12	2 14 57.81	1.8747	8 9 23.9	10.432
13	2 16 50.32	1.8757	8 19 48.8	10.397
14	2 18 42.90	1.8768	8 30 11.6	10.362
15	2 20 35.54	1.8780	8 40 32.2	10.325
16	2 22 28.26	1.8792	8 50 50.6	10.287
17	2 24 21.05	1.8805	9 1 6.7	10.249
18	2 26 13.92	1.8818	9 11 20.5	10.211
19	2 28 6.87	1.8832	9 21 32.0	10.172
20	2 29 59.90	1.8845	9 31 41.1	10.132
21	2 31 53.01	1.8859	9 41 47.8	10.091
22	2 33 46.21	1.8874	9 51 52.0	10.049
23	2 35 39.50	1.8889	N.10 1 53.7	10.008
	FRIDAY 14.			
0	2 37 32.88	1.8905	N.10 11 52.9	9.966
1	2 39 26.36	1.8922	10 21 49.6	9.923
2	2 41 19.94	1.8938	10 31 43.7	9.879
3	2 43 13.61	1.8954	10 41 35.1	9.834
4	2 45 7.39	1.8972	10 51 23.8	9.789
5	2 47 1.27	1.8989	11 1 9.8	9.744
6	2 48 55.26	1.9007	11 10 53.1	9.693
7	2 50 49.36	1.9026	11 20 33.7	9.652
8	2 52 43.57	1.9044	11 30 11.4	9.604
9	2 54 37.89	1.9063	11 39 46.2	9.556
10	2 56 32.33	1.9082	11 49 18.1	9.507
11	2 58 26.88	1.9102	11 58 47.1	9.459
12	3 0 21.55	1.9122	12 8 13.2	9.410
13	3 2 16.35	1.9143	12 17 36.3	9.359
14	3 4 11.27	1.9164	12 26 56.3	9.308
15	3 6 6.32	1.9185	12 36 13.2	9.256
16	3 8 1.49	1.9206	12 45 27.0	9.203
17	3 9 56.79	1.9228	12 54 37.6	9.151
18	3 11 52.23	1.9251	13 3 45.1	9.098
19	3 13 47.80	1.9273	13 12 49.4	9.044
20	3 15 43.50	1.9295	13 21 50.4	8.989
21	3 17 39.34	1.9318	13 30 48.0	8.933
22	3 19 35.32	1.9342	13 39 42.3	8.877
23	3 21 31.44	1.9365	13 48 33.2	8.820
24	3 23 27.70	1.9388	N.13 57 20.7	8.763

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY 15.			
	h m s	s	° ′ ″	″
0	3 23 27.70	1.9388	N.13 57 20.7	8.763
1	3 25 24.10	1.9412	14 6 4.8	8.705
2	3 27 20.65	1.9437	14 14 45.3	8.646
3	3 29 17.35	1.9462	14 23 22.3	8.587
4	3 31 14.20	1.9487	14 31 55.7	8.527
5	3 33 11.19	1.9511	14 40 25.5	8.467
6	3 35 8.33	1.9536	14 48 51.7	8.406
7	3 37 5.63	1.9562	14 57 14.2	8.344
8	3 39 3.08	1.9588	15 5 32.9	8.281
9	3 41 0.69	1.9614	15 13 47.9	8.218
10	3 42 58.45	1.9640	15 21 59.1	8.154
11	3 44 56.37	1.9667	15 30 6.4	8.090
12	3 46 54.45	1.9693	15 38 9.9	8.026
13	3 48 52.69	1.9720	15 46 9.5	7.960
14	3 50 51.09	1.9746	15 54 5.1	7.893
15	3 52 49.64	1.9773	16 1 56.7	7.826
16	3 54 48.36	1.9800	16 9 44.2	7.759
17	3 56 47.24	1.9827	16 17 27.7	7.691
18	3 58 46.29	1.9855	16 25 7.1	7.622
19	4 0 45.50	1.9882	16 32 42.3	7.552
20	4 2 44.88	1.9910	16 40 13.3	7.482
21	4 4 44.42	1.9938	16 47 40.1	7.412
22	4 6 44.13	1.9966	16 55 2.7	7.340
23	4 8 44.01	1.9994	N.17 2 20.9	7.267
	SUNDAY 16.			
0	4 10 44.06	2.0022	N.17 9 34.8	7.195
1	4 12 44.28	2.0050	17 16 44.3	7.122
2	4 14 44.66	2.0078	17 23 49.4	7.048
3	4 16 45.21	2.0106	17 30 50.1	6.973
4	4 18 45.93	2.0134	17 37 46.2	6.898
5	4 20 46.82	2.0162	17 44 37.8	6.823
6	4 22 47.88	2.0191	17 51 24.9	6.747
7	4 24 49.11	2.0219	17 58 7.4	6.669
8	4 26 50.51	2.0247	18 4 45.2	6.591
9	4 28 52.08	2.0276	18 11 18.3	6.512
10	4 30 53.82	2.0304	18 17 46.7	6.433
11	4 32 55.73	2.0332	18 24 10.3	6.354
12	4 34 57.81	2.0361	18 30 29.2	6.275
13	4 37 0.06	2.0389	18 36 43.3	6.194
14	4 39 2.48	2.0418	18 42 52.5	6.112
15	4 41 5.07	2.0446	18 48 56.7	6.029
16	4 43 7.83	2.0473	18 54 56.0	5.947
17	4 45 10.75	2.0501	19 0 50.4	5.865
18	4 47 13.84	2.0529	19 6 39.8	5.781
19	4 49 17.10	2.0557	19 12 24.1	5.696
20	4 51 20.52	2.0584	19 18 3.3	5.611
21	4 53 24.11	2.0612	19 23 37.4	5.526
22	4 55 27.87	2.0640	19 29 6.4	5.441
23	4 57 31.79	2.0667	19 34 30.3	5.355
24	4 59 35.87	2.0694	N.19 39 49.0	5.267

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	MONDAY 17.					**WEDNESDAY 19.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	4 59 35.87	2.0694	N.19 39 49.0	5.267	0	6 41 35.54	2.1673	N.22 2 48.2	0.537
1	5 1 40.11	2.0721	19 45 2.4	5.179	1	6 43 45.61	2.1683	22 3 17.2	0.430
2	5 3 44.52	2.0748	19 50 10.5	5.090	2	6 45 55.74	2.1693	22 3 39.8	0.323
3	5 5 49.09	2.0775	19 55 13.2	5.001	3	6 48 5.93	2.1703	22 3 56.0	0.216
4	5 7 53.82	2.0802	20 0 10.6	4.912	4	6 50 16.18	2.1713	22 4 5.7	0.109
5	5 9 58.71	2.0828	20 5 2.6	4.822	5	6 52 26.48	2.1722	22 4 9.0	+ 0.002
6	5 12 3.75	2.0854	20 9 49.3	4.732	6	6 54 36.84	2.1731	22 4 5.9	− 0.106
7	5 14 8.95	2.0880	20 14 30.5	4.641	7	6 56 47.25	2.1738	22 3 56.3	0.213
8	5 16 14.31	2.0906	20 19 6.2	4.549	8	6 58 57.70	2.1745	22 3 40.3	0.321
9	5 18 19.82	2.0931	20 23 36.4	4.457	9	7 1 8.19	2.1752	22 3 17.8	0.429
10	5 20 25.48	2.0956	20 28 1.0	4.364	10	7 3 18.72	2.1758	22 2 48.8	0.537
11	5 22 31.29	2.0982	20 32 20.1	4.271	11	7 5 29.29	2.1765	22 2 13.4	0.644
12	5 24 37.26	2.1007	20 36 33.6	4.178	12	7 7 39.90	2.1771	22 1 31.5	0.753
13	5 26 43.37	2.1031	20 40 41.5	4.084	13	7 9 50.54	2.1776	22 0 43.1	0.861
14	5 28 49.63	2.1056	20 44 43.7	3.989	14	7 12 1.21	2.1780	21 59 48.2	0.968
15	5 30 56.04	2.1080	20 48 40.2	3.894	15	7 14 11.90	2.1784	21 58 46.9	1.076
16	5 33 2.59	2.1103	20 52 31.0	3.798	16	7 16 22.62	2.1788	21 57 39.1	1.184
17	5 35 9.28	2.1126	20 56 16.0	3.702	17	7 18 33.36	2.1791	21 56 24.8	1.292
18	5 37 16.10	2.1149	20 59 55.3	3.606	18	7 20 44.11	2.1794	21 55 4.0	1.401
19	5 39 23.06	2.1172	21 3 28.8	3.509	19	7 22 54.88	2.1796	21 53 36.7	1.509
20	5 41 30.16	2.1195	21 6 56.4	3.412	20	7 25 5.66	2.1798	21 52 2.9	1.617
21	5 43 37.40	2.1217	21 10 18.2	3.314	21	7 27 16.45	2.1799	21 50 22.7	1.724
22	5 45 44.77	2.1239	21 13 34.1	3.216	22	7 29 27.25	2.1800	21 48 36.0	1.832
23	5 47 52.27	2.1261	N.21 16 44.1	3.117	23	7 31 38.05	2.1800	N.21 46 42.8	1.941
	TUESDAY 18.					**THURSDAY 20.**			
0	5 49 59.90	2.1282	N.21 19 48.1	3.017	0	7 33 48.85	2.1800	N.21 44 43.1	2.048
1	5 52 7.66	2.1303	21 22 46.2	2.918	1	7 35 59.65	2.1799	21 42 37.0	2.156
2	5 54 15.54	2.1323	21 25 38.3	2.818	2	7 38 10.44	2.1798	21 40 24.4	2.264
3	5 56 23.54	2.1343	21 28 24.4	2.718	3	7 40 21.23	2.1797	21 38 5.3	2.372
4	5 58 31.66	2.1363	21 31 4.5	2.617	4	7 42 32.01	2.1796	21 35 39.8	2.479
5	6 0 39.90	2.1382	21 33 38.5	2.517	5	7 44 42.78	2.1793	21 33 7.8	2.586
6	6 2 48.25	2.1402	21 36 6.5	2.416	6	7 46 53.53	2.1790	21 30 29.4	2.693
7	6 4 56.72	2.1421	21 38 28.4	2.314	7	7 49 4.26	2.1787	21 27 44.6	2.800
8	6 7 5.30	2.1438	21 40 44.1	2.211	8	7 51 14.97	2.1783	21 24 53.4	2.908
9	6 9 13.98	2.1456	21 42 53.7	2.108	9	7 53 25.66	2.1780	21 21 55.7	3.015
10	6 11 22.77	2.1473	21 44 57.1	2.005	10	7 55 36.33	2.1776	21 18 51.6	3.121
11	6 13 31.66	2.1491	21 46 54.3	1.903	11	7 57 46.97	2.1770	21 15 41.2	3.227
12	6 15 40.66	2.1508	21 48 45.4	1.800	12	7 59 57.57	2.1764	21 12 24.4	3.333
13	6 17 49.76	2.1524	21 50 30.3	1.696	13	8 2 8.14	2.1759	21 9 1.2	3.439
14	6 19 58.95	2.1539	21 52 8.9	1.591	14	8 4 18.68	2.1754	21 5 31.7	3.545
15	6 22 8.23	2.1554	21 53 41.2	1.486	15	8 6 29.19	2.1748	21 1 55.8	3.651
16	6 24 17.60	2.1569	21 55 7.2	1.382	16	8 8 39.66	2.1741	20 58 13.6	3.756
17	6 26 27.06	2.1584	21 56 27.0	1.277	17	8 10 50.08	2.1733	20 54 25.1	3.861
18	6 28 36.61	2.1598	21 57 40.5	1.172	18	8 13 0.46	2.1726	20 50 30.3	3.966
19	6 30 46.24	2.1611	21 58 47.6	1.066	19	8 15 10.79	2.1718	20 46 29.2	4.070
20	6 32 55.95	2.1624	21 59 48.4	0.961	20	8 17 21.08	2.1711	20 42 21.9	4.174
21	6 35 5.73	2.1637	22 0 42.9	0.855	21	8 19 31.32	2.1702	20 38 8.3	4.278
22	6 37 15.59	2.1650	22 1 31.0	0.749	22	8 21 41.51	2.1693	20 33 48.5	4.382
23	6 39 25.53	2.1662	22 2 12.8	0.643	23	8 23 51.64	2.1683	20 29 22.4	4.486
24	6 41 35.54	2.1673	N.22 2 48.2	0.537	24	8 26 1.71	2.1673	N.20 24 50.1	4.589

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	FRIDAY 21.			
	h m s	s	° ′ ″	″
0	8 26 1.71	2.1673	N.20 24 50.1	4.589
1	8 28 11.72	2.1664	20 20 11.7	4.692
2	8 30 21.68	2.1655	20 15 27.1	4.794
3	8 32 31.58	2.1645	20 10 36.4	4.896
4	8 34 41.42	2.1634	20 5 39.6	4.997
5	8 36 51.19	2.1623	20 0 36.7	5.099
6	8 39 0.90	2.1612	19 55 27.7	5.200
7	8 41 10.54	2.1601	19 50 12.7	5.300
8	8 43 20.11	2.1590	19 44 51.7	5.401
9	8 45 29.62	2.1578	19 39 24.6	5.501
10	8 47 39.05	2.1566	19 33 51.6	5.600
11	8 49 48.41	2.1553	19 28 12.6	5.699
12	8 51 57.69	2.1541	19 22 27.7	5.798
13	8 54 6.90	2.1528	19 16 36.9	5.896
14	8 56 16.03	2.1515	19 10 40.2	5.993
15	8 58 25.08	2.1502	19 4 37.7	6.091
16	9 0 34.06	2.1490	18 58 29.3	6.188
17	9 2 42.96	2.1477	18 52 15.1	6.284
18	9 4 51.78	2.1463	18 45 55.2	6.380
19	9 7 0.52	2.1450	18 39 29.5	6.476
20	9 9 9.18	2.1436	18 32 58.1	6.571
21	9 11 17.75	2.1422	18 26 21.0	6.665
22	9 13 26.24	2.1408	18 19 38.3	6.759
23	9 15 34.65	2.1394	N.18 12 49.9	6.853
	SATURDAY 22.			
0	9 17 42.97	2.1380	N.18 5 55.9	6.947
1	9 19 51.21	2.1366	17 58 56.3	7.039
2	9 21 59.36	2.1352	17 51 51.2	7.131
3	9 24 7.43	2.1338	17 44 40.6	7.222
4	9 26 15.42	2.1324	17 37 24.5	7.313
5	9 28 23.32	2.1309	17 30 3.0	7.403
6	9 30 31.13	2.1295	17 22 36.1	7.493
7	9 32 38.86	2.1281	17 15 3.8	7.582
8	9 34 46.50	2.1266	17 7 26.2	7.672
9	9 36 54.05	2.1252	16 59 43.2	7.761
10	9 39 1.52	2.1237	16 51 54.9	7.848
11	9 41 8.90	2.1223	16 44 1.4	7.935
12	9 43 16.20	2.1209	16 36 2.7	8.022
13	9 45 23.41	2.1195	16 27 58.8	8.108
14	9 47 30.54	2.1182	16 19 49.8	8.193
15	9 49 37.59	2.1167	16 11 35.7	8.278
16	9 51 44.55	2.1153	16 3 16.5	8.363
17	9 53 51.43	2.1139	15 54 52.2	8.447
18	9 55 58.22	2.1126	15 46 22.9	8.529
19	9 58 4.94	2.1112	15 37 48.7	8.611
20	10 0 11.57	2.1098	15 29 9.6	8.693
21	10 2 18.12	2.1085	15 20 25.5	8.775
22	10 4 24.59	2.1072	15 11 36.6	8.855
23	10 6 30.98	2.1059	15 2 42.9	8.935
24	10 8 37.30	2.1046	N.14 53 44.4	9.015

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SUNDAY 23.			
	h m s	s	° ′ ″	″
0	10 8 37.30	2.1046	N.14 53 44.4	9.015
1	10 10 43.54	2.1033	14 44 41.1	9.093
2	10 12 49.70	2.1021	14 35 33.2	9.171
3	10 14 55.79	2.1009	14 26 20.6	9.248
4	10 17 1.81	2.0997	14 17 3.4	9.325
5	10 19 7.75	2.0984	14 7 41.6	9.402
6	10 21 13.62	2.0973	13 58 15.2	9.477
7	10 23 19.42	2.0962	13 48 44.3	9.552
8	10 25 25.16	2.0951	13 39 9.0	9.626
9	10 27 30.83	2.0939	13 29 29.2	9.700
10	10 29 36.43	2.0928	13 19 45.0	9.772
11	10 31 41.97	2.0918	13 9 56.5	9.844
12	10 33 47.45	2.0908	13 0 3.7	9.916
13	10 35 52.87	2.0898	12 50 6.6	9.987
14	10 37 58.23	2.0889	12 40 5.3	10.057
15	10 40 3.54	2.0880	12 29 59.8	10.126
16	10 42 8.79	2.0871	12 19 50.2	10.194
17	10 44 13.99	2.0862	12 9 36.5	10.262
18	10 46 19.13	2.0854	11 59 18.7	10.330
19	10 48 24.23	2.0846	11 48 56.9	10.397
20	10 50 29.28	2.0838	11 38 31.1	10.462
21	10 52 34.28	2.0830	11 28 1.4	10.527
22	10 54 39.24	2.0823	11 17 27.8	10.592
23	10 56 44.16	2.0817	N.11 6 50.4	10.656
	MONDAY 24.			
0	10 58 49.05	2.0812	N.10 56 9.1	10.719
1	11 0 53.90	2.0806	10 45 24.1	10.781
2	11 2 58.72	2.0800	10 34 35.4	10.842
3	11 5 3.50	2.0795	10 23 43.0	10.903
4	11 7 8.26	2.0791	10 12 47.0	10.963
5	11 9 12.99	2.0787	10 1 47.5	11.022
6	11 11 17.70	2.0783	9 50 44.4	11.081
7	11 13 22.38	2.0779	9 39 37.8	11.138
8	11 15 27.05	2.0777	9 28 27.8	11.195
9	11 17 31.70	2.0774	9 17 14.4	11.252
10	11 19 36.34	2.0772	9 5 57.6	11.307
11	11 21 40.97	2.0771	8 54 37.5	11.362
12	11 23 45.59	2.0770	8 43 14.2	11.415
13	11 25 50.21	2.0770	8 31 47.7	11.468
14	11 27 54.83	2.0769	8 20 18.0	11.521
15	11 29 59.44	2.0769	8 8 45.2	11.572
16	11 32 4.06	2.0771	7 57 9.4	11.623
17	11 34 8.69	2.0772	7 45 30.5	11.673
18	11 36 13.33	2.0774	7 33 48.6	11.722
19	11 38 17.98	2.0776	7 22 3.8	11.770
20	11 40 22.64	2.0778	7 10 16.2	11.817
21	11 42 27.32	2.0782	6 58 25.8	11.863
22	11 44 32.03	2.0787	6 46 32.6	11.909
23	11 46 36.76	2.0791	6 34 36.7	11.955
24	11 48 41.52	2.0796	N. 6 22 38.0	12.000

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	TUESDAY 25.			
	h m s	s	° ′ ″	″
0	11 48 41.52	2.0796	N. 6 22 38.0	12.000
1	11 50 46.31	2.0802	6 10 36.7	12.042
2	11 52 51.14	2.0808	5 58 32.9	12.084
3	11 54 56.01	2.0815	5 46 26.6	12.126
4	11 57 0.92	2.0822	5 34 17.8	12.167
5	11 59 5.87	2.0829	5 22 6.6	12.206
6	12 1 10.87	2.0837	5 9 53.1	12.245
7	12 3 15.92	2.0847	4 57 37.2	12.284
8	12 5 21.03	2.0857	4 45 19.0	12.321
9	12 7 26.20	2.0867	4 32 58.7	12.356
10	12 9 31.43	2.0877	4 20 36.3	12.392
11	12 11 36.73	2.0888	4 8 11.7	12.427
12	12 13 42.09	2.0900	3 55 45.1	12.460
13	12 15 47.53	2.0913	3 43 16.5	12.492
14	12 17 53.05	2.0926	3 30 46.0	12.524
15	12 19 58.64	2.0939	3 18 13.6	12.555
16	12 22 4.32	2.0954	3 5 39.4	12.585
17	12 24 10.09	2.0969	2 53 3.4	12.613
18	12 26 15.95	2.0984	2 40 25.8	12.640
19	12 28 21.90	2.1000	2 27 46.6	12.667
20	12 30 27.95	2.1018	2 15 5.8	12.693
21	12 32 34.11	2.1036	2 2 23.4	12.719
22	12 34 40.38	2.1054	1 49 39.5	12.743
23	12 36 46.76	2.1073	N. 1 36 54.2	12.766
	WEDNESDAY 26.			
0	12 38 53.25	2.1092	N. 1 24 7.6	12.787
1	12 40 59.86	2.1112	1 11 19.7	12.808
2	12 43 6.59	2.1132	0 58 30.6	12.827
3	12 45 13.44	2.1153	0 45 40.4	12.846
4	12 47 20.42	2.1175	0 32 49.1	12.864
5	12 49 27.54	2.1198	0 19 56.7	12.882
6	12 51 34.80	2.1222	N. 0 7 3.3	12.898
7	12 53 42.20	2.1245	S. 0 5 51.0	12.912
8	12 55 49.74	2.1269	0 18 46.1	12.925
9	12 57 57.43	2.1295	0 31 42.0	12.937
10	13 0 5.28	2.1321	0 44 38.6	12.949
11	13 2 13.28	2.1347	0 57 35.9	12.959
12	13 4 21.44	2.1374	1 10 33.7	12.968
13	13 6 29.77	2.1402	1 23 32.0	12.976
14	13 8 38.27	2.1430	1 36 30.8	12.983
15	13 10 46.93	2.1458	1 49 30.0	12.989
16	13 12 55.77	2.1489	2 2 29.5	12.993
17	13 15 4.80	2.1520	2 15 29.2	12.997
18	13 17 14.01	2.1551	2 28 29.1	12.999
19	13 19 23.41	2.1582	2 41 29.1	13.000
20	13 21 33.00	2.1614	2 54 29.1	12.999
21	13 23 42.78	2.1647	3 7 29.0	12.997
22	13 25 52.76	2.1681	3 20 28.8	12.995
23	13 28 2.95	2.1715	3 33 28.4	12.992
24	13 30 13.34	2.1750	S. 3 46 27.8	12.987

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	THURSDAY 27.			
	h m s	s	° ′ ″	″
0	13 30 13.34	2.1750	S. 3 46 27.8	12.987
1	13 32 23.95	2.1786	3 59 26.8	12.980
2	13 34 34.77	2.1822	4 12 25.4	12.972
3	13 36 45.81	2.1859	4 25 23.5	12.963
4	13 38 57.08	2.1896	4 38 21.0	12.953
5	13 41 8.57	2.1934	4 51 17.9	12.942
6	13 43 20.29	2.1973	5 4 14.1	12.930
7	13 45 32.25	2.2013	5 17 9.5	12.916
8	13 47 44.45	2.2053	5 30 4.0	12.900
9	13 49 56.89	2.2093	5 42 57.5	12.883
10	13 52 9.57	2.2134	5 55 50.0	12.865
11	13 54 22.50	2.2176	6 8 41.3	12.845
12	13 56 35.69	2.2219	6 21 31.4	12.824
13	13 58 49.13	2.2262	6 34 20.2	12.802
14	14 1 2.83	2.2306	6 47 7.7	12.779
15	14 3 16.80	2.2350	6 59 53.7	12.754
16	14 5 31.03	2.2395	7 12 38.2	12.728
17	14 7 45.54	2.2441	7 25 21.1	12.700
18	14 10 0.32	2.2486	7 38 2.2	12.670
19	14 12 15.37	2.2532	7 50 41.5	12.640
20	14 14 30.70	2.2579	8 3 19.0	12.608
21	14 16 46.32	2.2627	8 15 54.5	12.574
22	14 19 2.23	2.2676	8 28 27.9	12.539
23	14 21 18.43	2.2724	S. 8 40 59.2	12.502
	FRIDAY 28.			
0	14 23 34.92	2.2773	S. 8 53 28.2	12.464
1	14 25 51.71	2.2823	9 5 54.9	12.425
2	14 28 8.80	2.2873	9 18 19.2	12.383
3	14 30 26.18	2.2923	9 30 40.9	12.340
4	14 32 43.87	2.2974	9 43 0.0	12.297
5	14 35 1.87	2.3026	9 55 16.5	12.251
6	14 37 20.18	2.3078	10 7 30.1	12.203
7	14 39 38.81	2.3131	10 19 40.8	12.154
8	14 41 57.75	2.3183	10 31 48.6	12.104
9	14 44 17.01	2.3236	10 43 53.3	12.052
10	14 46 36.59	2.3290	10 55 54.8	11.998
11	14 48 56.49	2.3344	11 7 53.1	11.943
12	14 51 16.72	2.3399	11 19 48.0	11.886
13	14 53 37.28	2.3454	11 31 39.4	11.827
14	14 55 58.17	2.3509	11 43 27.3	11.767
15	14 58 19.39	2.3564	11 55 11.5	11.706
16	15 0 40.94	2.3619	12 6 52.0	11.643
17	15 3 2.82	2.3675	12 18 28.6	11.578
18	15 5 25.04	2.3732	12 30 1.3	11.511
19	15 7 47.60	2.3788	12 41 29.9	11.442
20	15 10 10.50	2.3845	12 52 54.4	11.372
21	15 12 33.74	2.3902	13 4 14.6	11.300
22	15 14 57.32	2.3959	13 15 30.4	11.227
23	15 17 21.25	2.4017	13 26 41.8	11.152
24	15 19 45.52	2.4074	S. 13 37 48.6	11.074

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY 29.			
	h m s	s	° ′ ″	″
0	15 19 45.52	2.4074	S. 13 37 48.6	11.074
1	15 22 10.14	2.4132	13 48 50.7	10.996
2	15 24 35.10	2.4189	13 59 48.1	10.917
3	15 27 0.41	2.4247	14 10 40.7	10.835
4	15 29 26.07	2.4306	14 21 28.3	10.751
5	15 31 52.08	2.4363	14 32 10.8	10.666
6	15 34 18.43	2.4421	14 42 48.2	10.579
7	15 36 45.13	2.4479	14 53 20.3	10.490
8	15 39 12.18	2.4538	15 3 47.0	10.400
9	15 41 39.58	2.4596	15 14 8.3	10.308
10	15 44 7.33	2.4653	15 24 24.0	10.214
11	15 46 35.42	2.4711	15 34 34.0	10.119
12	15 49 3.86	2.4768	15 44 38.3	10.022
13	15 51 32.64	2.4826	15 54 36.7	9.923
14	15 54 1.77	2.4883	16 4 29.1	9.822
15	15 56 31.24	2.4940	16 14 15.4	9.720
16	15 59 1.05	2.4997	16 23 55.5	9.617
17	16 1 31.21	2.5055	16 33 29.4	9.512
18	16 4 1.71	2.5111	16 42 56.9	9.404
19	16 6 32.54	2.5167	16 52 17.9	9.295
20	16 9 3.71	2.5223	17 1 32.3	9.185
21	16 11 35.22	2.5279	17 10 40.1	9.073
22	16 14 7.06	2.5333	17 19 41.1	8.959
23	16 16 39.22	2.5387	S. 17 28 35.2	8.843
	SUNDAY 30.			
0	16 19 11.71	2.5441	S. 17 37 22.3	8.727
1	16 21 44.52	2.5495	17 46 2.4	8.608
2	16 24 17.65	2.5549	17 54 35.3	8.488
3	16 26 51.11	2.5602	18 3 1.0	8.367
4	16 29 24.88	2.5654	18 11 19.3	8.243
5	16 31 58.96	2.5706	18 19 30.2	8.119
6	16 34 33.35	2.5757	18 27 33.6	7.993
7	16 37 8.04	2.5807	18 35 29.4	7.865
8	16 39 43.03	2.5857	18 43 17.4	7.735
9	16 42 18.32	2.5906	18 50 57.6	7.604
10	16 44 53.90	2.5954	18 58 29.9	7.472
11	16 47 29.76	2.6001	19 5 54.3	7.339
12	16 50 5.91	2.6048	19 13 10.6	7.204
13	16 52 42.34	2.6094	19 20 18.8	7.067
14	16 55 19.04	2.6138	19 27 18.7	6.929
15	16 57 56.00	2.6182	19 34 10.3	6.791
16	17 0 33.23	2.6226	19 40 53.6	6.651
17	17 3 10.71	2.6267	19 47 28.4	6.508
18	17 5 48.44	2.6308	19 53 54.6	6.365
19	17 8 26.41	2.6349	20 0 12.2	6.222
20	17 11 4.63	2.6389	20 6 21.2	6.077
21	17 13 43.08	2.6427	20 12 21.4	5.930
22	17 16 21.75	2.6464	20 18 12.8	5.782
23	17 19 0.64	2.6500	20 23 55.3	5.633
24	17 21 39.75	2.6535	S. 20 29 28.8	5.483

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	MONDAY 31.			
	h m s	s	° ′ ″	″
0	17 21 39.75	2.6535	S. 20 29 28.8	5.483
1	17 24 19.06	2.6568	20 34 53.3	5.332
2	17 26 58.57	2.6601	20 40 8.7	5.180
3	17 29 38.27	2.6632	20 45 14.9	5.027
4	17 32 18.16	2.6662	20 50 11.9	4.873
5	17 34 58.22	2.6691	20 54 59.7	4.719
6	17 37 38.45	2.6718	20 59 38.2	4.563
7	17 40 18.84	2.6745	21 4 7.3	4.406
8	17 42 59.39	2.6770	21 8 26.9	4.249
9	17 45 40.08	2.6793	21 12 37.1	4.091
10	17 48 20.91	2.6816	21 16 37.8	3.932
11	17 51 1.87	2.6837	21 20 28.9	3.771
12	17 53 42.95	2.6856	21 24 10.3	3.610
13	17 56 24.14	2.6874	21 27 42.1	3.449
14	17 59 5.44	2.6892	21 31 4.2	3.288
15	18 1 46.84	2.6907	21 34 16.7	3.126
16	18 4 28.32	2.6920	21 37 19.4	2.963
17	18 7 9.88	2.6932	21 40 12.3	2.800
18	18 9 51.51	2.6943	21 42 55.4	2.636
19	18 12 33.20	2.6952	21 45 28.7	2.472
20	18 15 14.94	2.6960	21 47 52.1	2.308
21	18 17 56.72	2.6967	21 50 5.7	2.144
22	18 20 38.54	2.6972	21 52 9.4	1.978
23	18 23 20.38	2.6975	S. 21 54 3.1	1.812
	TUESDAY, JANUARY 1, 1889.			
0	18 26 2.24	2.6977	S. 21 55 46.9	1.647

PHASES OF THE MOON.

		d	h	m
●	New Moon. . . Dec.	2	22	5.6
☽	First Quarter	9	18	45.8
○	Full Moon	17	22	40.8
☾	Last Quarter	25	17	59.9

		d	h
☾	Perigee . . . . Dec.	2	15.5
☾	Apogee	15	17.2
☾	Perigee	31	5.7

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	III^h.	P. L. of Diff.	VI^h.	P. L. of Diff	IX^h.	P. L. of Diff.
4	Sun W.	15° 27′ 26″	2401	17° 10′ 59″	2394	18° 54′ 42″	2392	20° 38′ 28″	2394
	Fomalhaut E.	66 49 28	2261	65 2 31	2278	63 15 59	2296	61 29 54	2317
	α Pegasi E.	83 26 55	2401	81 43 22	2414	80 0 7	2429	78 17 13	2445
5	Sun W.	29 15 32	2435	30 58 17	2448	32 40 44	2461	34 22 52	2476
	Fomalhaut E.	52 47 51	2448	51 5 25	2482	49 23 46	2517	47 42 57	2556
	α Pegasi E.	69 49 15	2551	68 9 12	2577	66 29 45	2605	64 50 57	2635
6	Sun W.	42 48 6	2558	44 27 59	2576	46 7 27	2594	47 46 30	2613
	Fomalhaut E.	39 33 42	2808	37 59 25	2875	36 26 34	2949	34 55 17	3031
	α Pegasi E.	56 47 59	2818	55 13 54	2862	53 40 46	2909	52 8 38	2959
	α Arietis E.	98 24 50	2379	96 40 45	2395	94 57 3	2412	93 13 45	2429
7	Sun W.	55 55 12	2711	57 31 37	2732	59 7 35	2752	60 43 6	2772
	Venus W.	18 47 11	2794	20 21 47	2811	21 56 1	2828	23 29 52	2847
	α Arietis E.	84 43 44	2525	83 3 5	2545	81 22 54	2566	79 43 12	2586
	Aldebaran E.	116 7 25	2375	114 23 15	2394	112 39 32	2413	110 56 16	2432
8	Sun W.	68 34 4	2873	70 6 57	2893	71 39 25	2913	73 11 27	2933
	α Aquilæ W.	40 16 4	4427	41 21 1	4320	42 27 35	4296	43 35 37	4143
	Venus W.	31 12 59	2945	32 44 21	2964	34 15 19	2984	35 45 52	3004
	Mars W.	20 29 48	2781	22 4 41	2802	23 39 6	2822	25 13 5	2842
	α Arietis E.	71 31 53	2694	69 55 5	2716	68 18 47	2740	66 43 0	2763
	Aldebaran E.	102 26 39	2527	100 46 3	2545	99 5 53	2564	97 26 9	2583
9	Sun W.	80 45 28	3029	82 15 5	3047	83 44 20	3065	85 13 12	3082
	α Aquilæ W.	49 32 40	3862	50 46 38	3824	52 1 15	3792	53 16 26	3763
	Venus W.	43 12 36	3099	44 40 47	3117	46 8 36	3135	47 36 3	3153
	Mars W.	32 56 51	2935	34 28 25	2954	35 59 36	2971	37 30 25	2989
	α Arietis E.	58 51 40	2881	57 18 57	2906	55 46 46	2931	54 15 7	2957
	Aldebaran E.	89 13 40	2672	87 36 22	2689	85 59 27	2705	84 22 54	2721
10	Sun W.	92 32 18	3167	93 59 7	3182	95 25 38	3198	96 51 50	3212
	α Aquilæ W.	59 38 42	3667	60 56 4	3655	62 13 39	3645	63 31 25	3636
	Venus W.	54 48 4	3237	56 13 29	3253	57 38 35	3268	59 3 24	3283
	Mars W.	44 59 8	3072	46 27 52	3087	47 56 18	3101	49 24 26	3116
	α Arietis E.	46 45 14	3098	45 17 2	3129	43 49 28	3162	42 22 33	3197
	Aldebaran E.	76 25 26	2799	74 50 57	2813	73 16 46	2828	71 42 54	2842
11	Sun W.	103 58 40	3280	105 23 15	3293	106 47 35	3304	108 11 42	3316
	α Aquilæ W.	70 2 1	3613	71 20 21	3612	72 38 42	3611	73 57 4	3611
	Venus W.	66 3 16	3351	67 26 28	3364	68 49 26	3376	70 12 10	3387
	Mars W.	56 40 50	3183	58 7 20	3195	59 33 35	3207	60 59 36	3218
	Fomalhaut W.	34 43 8	3600	36 1 42	3563	37 20 57	3529	38 40 49	3500
	Aldebaran E.	63 57 49	2904	62 25 35	2916	60 53 36	2926	59 21 50	2937
12	Sun W.	115 9 7	3366	116 32 2	3376	117 54 46	3384	119 17 21	3392
	α Aquilæ W.	80 28 41	3620	81 46 54	3623	83 5 3	3627	84 23 8	3632
	Venus W.	77 2 44	3438	78 24 17	3447	79 45 40	3455	81 6 54	3463
	Mars W.	68 6 33	3268	69 31 22	3276	70 56 1	3284	72 20 31	3292
	Fomalhaut W.	45 26 53	3405	46 49 4	3392	48 11 30	3381	49 34 8	3372
	α Pegasi W.	34 18 7	4501	35 21 58	4399	36 27 20	4308	37 34 5	4228

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^h.	P. L. of Diff.	XVIII^h.	P. L. of Diff.	XXI^h.	P. L. of Diff.
4	Sun	W.	22° 22′ 12″	2398	24° 5′ 49″	2405	25° 49′ 16″	2414	27° 32′ 31″	2424
	Fomalhaut	E.	59 44 19	2339	57 59 17	2364	56 14 50	2389	54 31 0	2418
	α Pegasi	E.	76 34 43	2463	74 52 38	2482	73 11 0	2504	71 29 52	2526
5	Sun	W.	36 4 39	2492	37 46 4	2507	39 27 7	2523	41 7 48	2540
	Fomalhaut	E.	46 3 1	2598	44 24 3	2643	42 46 7	2693	41 9 18	2748
	α Pegasi	E.	63 12 50	2667	61 35 26	2701	59 58 48	2738	58 22 58	2776
6	Sun	W.	49 25 7	2632	51 3 18	2652	52 41 2	2672	54 18 20	2691
	Fomalhaut	E.	33 25 43	3124	31 58 3	3229	30 32 28	3348	29 9 12	3485
	α Pegasi	E.	50 37 34	3014	49 7 38	3071	47 38 53	3133	46 11 24	3201
	α Arietis	E.	91 30 52	2448	89 48 25	2466	88 6 24	2485	86 24 50	2505
7	Sun	W.	62 18 11	2792	63 52 49	2813	65 27 0	2833	67 0 45	2853
	Venus	W.	25 3 19	2866	26 36 21	2885	28 8 59	2905	29 41 12	2925
	α Arietis	E.	78 3 58	2607	76 25 13	2629	74 46 57	2650	73 9 10	2672
	Aldebaran	E.	109 13 27	2451	107 31 5	2470	105 49 10	2489	104 7 41	2508
8	Sun	W.	74 43 4	2953	76 14 16	2972	77 45 4	2991	79 15 28	3010
	α Aquilæ	W.	44 44 57	4071	45 55 27	4008	47 6 59	3953	48 19 25	3905
	Venus	W.	37 16 0	3023	38 45 44	3042	40 15 5	3061	41 44 2	3080
	Mars	W.	26 46 39	2861	28 19 48	2880	29 52 33	2898	31 24 54	2917
	α Arietis	E.	65 7 43	2786	63 32 57	2809	61 58 41	2832	60 24 55	2856
	Aldebaran	E.	95 46 50	2601	94 7 56	2619	92 29 27	2637	90 51 22	2654
9	Sun	W.	86 41 43	3100	88 9 53	3117	89 37 42	3134	91 5 10	3151
	α Aquilæ	W.	54 32 7	3738	55 48 14	3716	57 4 44	3697	58 21 34	3680
	Venus	W.	49 3 8	3171	50 29 52	3188	51 56 16	3204	53 22 20	3221
	Mars	W.	39 0 51	3006	40 30 56	3023	42 0 40	3039	43 30 4	3056
	α Arietis	E.	52 44 0	2983	51 13 26	3011	49 43 27	3039	48 14 3	3068
	Aldebaran	E.	82 46 42	2737	81 10 51	2753	79 35 22	2769	78 0 14	2785
10	Sun	W.	98 17 45	3226	99 43 23	3240	101 8 45	3254	102 33 50	3267
	α Aquilæ	W.	64 49 20	3629	66 7 23	3624	67 25 31	3620	68 43 44	3616
	Venus	W.	60 27 55	3298	61 52 9	3312	63 16 7	3325	64 39 49	3338
	Mars	W.	50 52 16	3130	52 19 49	3144	53 47 5	3158	55 14 5	3170
	α Arietis	E.	40 56 20	3233	39 30 50	3271	38 6 5	3313	36 42 8	3358
	Aldebaran	E.	70 9 20	2855	68 36 3	2867	67 3 2	2880	65 30 18	2892
11	Sun	W.	109 35 35	3327	110 59 15	3337	112 22 44	3347	113 46 1	3357
	α Aquilæ	W.	75 15 26	3612	76 33 47	3613	77 52 7	3615	79 10 25	3617
	Venus	W.	71 34 41	3399	72 56 59	3409	74 19 5	3419	75 41 0	3429
	Mars	W.	62 25 24	3229	63 50 59	3239	65 16 22	3249	66 41 33	3259
	Fomalhaut	W.	40 1 13	3475	41 22 5	3454	42 43 21	3435	44 4 58	3419
	Aldebaran	E.	57 50 18	2947	56 18 59	2957	54 47 52	2966	53 16 57	2976
12	Sun	W.	120 39 47	3400	122 2 4	3407	123 24 13	3413	124 46 15	3420
	α Aquilæ	W.	85 41 8	3635	86 59 4	3640	88 16 55	3646	89 34 40	3651
	Venus	W.	82 27 59	3471	83 48 55	3479	85 9 43	3485	86 30 24	3491
	Mars	W.	73 44 52	3300	75 9 4	3306	76 33 8	3313	77 57 4	3319
	Fomalhaut	W.	50 56 56	3364	52 19 54	3356	53 43 1	3349	55 6 16	3343
	α Pegasi	W.	38 42 5	4156	39 51 13	4092	41 1 22	4035	42 12 27	3984

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Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	III^h.	P. L. of Diff.	VI^h.	P. L. of Diff.	IX^h.	P. L. of Diff.
12	Aldebaran	E.	51° 46′ 14″	2985	50° 15′ 42″	2993	48° 45′ 20″	3000	47° 15′ 7″	3007
	Pollux	E.	96 0 11	3009	94 30 10	3018	93 0 19	3026	91 30 38	3033
13	Sun	W.	126 8 9	3426	127 29 56	3431	128 51 37	3437	130 13 12	3442
	Venus	W.	87 50 58	3497	89 11 25	3503	90 31 46	3507	91 52 2	3512
	Mars	W.	79 20 53	3325	80 44 35	3331	82 8 11	3336	83 31 41	3340
	Fomalhaut	W.	56 29 38	3338	57 53 6	3333	59 16 39	3329	60 40 17	3325
	α Pegasi	W.	43 24 22	3938	44 37 3	3896	45 50 27	3858	47 4 29	3824
	Aldebaran	E.	39 46 15	3040	38 16 52	3045	36 47 35	3051	35 18 25	3056
	Pollux	E.	84 4 18	3064	82 35 24	3069	81 6 37	3073	79 37 55	3078
14	Venus	W.	98 32 11	3531	99 52 1	3533	101 11 49	3535	102 31 34	3537
	Fomalhaut	W.	67 39 29	3310	69 3 29	3307	70 27 32	3305	71 51 38	3302
	α Pegasi	W.	53 22 33	3693	54 39 28	3673	55 56 44	3653	57 14 21	3636
	Pollux	E.	72 15 44	3097	70 47 31	3101	69 19 22	3103	67 51 16	3105
	Saturn	E.	100 0 12	3057	98 31 10	3060	97 2 11	3061	95 33 14	3063
	Regulus	E.	108 1 46	3070	106 33 0	3072	105 4 16	3074	103 35 34	3076
15	Fomalhaut	W.	78 52 45	3293	80 17 5	3291	81 41 27	3289	83 5 51	3288
	α Pegasi	W.	63 46 40	3566	65 5 51	3555	66 25 15	3544	67 44 51	3534
	Pollux	E.	60 31 25	3114	59 3 33	3116	57 35 43	3117	56 7 54	3119
	Saturn	E.	88 8 52	3068	86 40 3	3068	85 11 14	3067	83 42 24	3066
	Regulus	E.	96 12 33	3081	94 44 0	3081	93 15 27	3080	91 46 53	3079
16	Fomalhaut	W.	90 8 20	3280	91 32 55	3278	92 57 32	3277	94 22 10	3276
	α Pegasi	W.	74 25 25	3491	75 45 59	3484	77 6 41	3478	78 27 30	3471
	α Arietis	W.	30 57 55	3681	32 15 2	3629	33 33 5	3584	34 51 57	3545
	Pollux	E.	48 49 10	3123	47 21 28	3124	45 53 48	3125	44 26 9	3126
	Saturn	E.	76 18 1	3061	74 49 4	3060	73 20 5	3058	71 51 4	3056
	Regulus	E.	84 23 53	3075	82 55 13	3073	81 26 31	3072	79 57 47	3069
17	α Pegasi	W.	85 13 13	3446	86 34 38	3441	87 56 8	3438	89 17 42	3433
	α Arietis	W.	41 35 39	3401	42 57 55	3379	44 20 35	3359	45 43 38	3340
	Pollux	E.	37 8 18	3135	35 40 51	3139	34 13 29	3143	32 46 12	3148
	Saturn	E.	64 25 15	3043	62 55 55	3040	61 26 32	3037	59 57 5	3034
	Regulus	E.	72 33 25	3057	71 4 23	3055	69 35 18	3052	68 6 9	3049
18	α Arietis	W.	52 43 52	3264	54 8 46	3250	55 33 56	3238	56 59 20	3226
	Aldebaran	W.	19 40 37	3044	21 9 55	3038	22 39 21	3031	24 8 55	3025
	Saturn	E.	52 28 46	3015	50 58 52	3011	49 28 53	3007	47 58 49	3002
	Regulus	E.	60 39 25	3030	59 9 50	3027	57 40 11	3023	56 10 27	3018
19	α Arietis	W.	64 9 39	3174	65 36 19	3164	67 3 11	3155	68 30 14	3147
	Aldebaran	W.	31 38 36	2997	33 8 53	2990	34 39 18	2985	36 9 50	2979
	Saturn	E.	40 27 4	2980	38 56 26	2974	37 25 41	2969	35 54 50	2965
	Regulus	E.	48 40 26	2997	47 10 9	2992	45 39 46	2988	44 9 18	2983
	Spica	E.	102 36 16	3025	101 6 34	3019	99 36 45	3014	98 6 49	3009
20	α Arietis	W.	75 48 5	3104	77 16 10	3096	78 44 24	3088	80 12 48	3080
	Aldebaran	W.	43 44 21	2948	45 15 39	2942	46 47 4	2936	48 18 37	2929
	Regulus	E.	36 35 25	2958	35 4 20	2953	33 33 8	2948	32 1 50	2942
	Spica	E.	90 35 26	2979	89 4 47	2973	87 34 0	2967	86 3 6	2961

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12	Aldebaran	E.	45° 45′ 3″	3015	44° 15′ 9″	3022	42° 45′ 23″	3028	41° 15′ 45″	3034
	Pollux	E.	90 1 6	3040	88 31 43	3046	87 2 27	3052	85 33 19	3058
13	Sun	W.	131 34 41	3446	132 56 5	3450	134 17 25	3454	135 38 40	3458
	Venus	W.	93 12 13	3516	94 32 19	3520	95 52 21	3525	97 12 18	3528
	Mars	W.	84 55 6	3345	86 18 26	3349	87 41 41	3352	89 4 52	3355
	Fomalhaut	W.	62 4 0	3321	63 27 47	3318	64 51 38	3315	66 15 32	3313
	α Pegasi	W.	48 19 6	3792	49 34 16	3765	50 49 55	3739	52 6 1	3714
	Aldebaran	E.	33 49 21	3060	32 20 22	3065	30 51 29	3069	29 22 41	3072
	Pollux	E.	78 9 19	3082	76 40 48	3087	75 12 22	3091	73 44 1	3094
14	Venus	W.	103 51 17	3539	105 10 58	3540	106 30 38	3541	107 50 17	3541
	Fomalhaut	W.	73 15 47	3300	74 39 58	3299	76 4 11	3296	77 28 27	3294
	α Pegasi	W.	58 32 16	3620	59 50 29	3605	61 8 58	3591	62 27 42	3578
	Pollux	E.	66 23 13	3108	64 55 13	3110	63 27 15	3111	61 59 19	3113
	Saturn	E.	94 4 19	3064	92 35 25	3065	91 6 33	3066	89 37 42	3067
	Regulus	E.	102 6 55	3078	100 38 18	3078	99 9 42	3079	97 41 7	3080
15	Fomalhaut	W.	84 30 17	3286	85 54 45	3284	87 19 15	3282	88 43 47	3282
	α Pegasi	W.	69 4 38	3525	70 24 35	3515	71 44 42	3506	73 4 59	3498
	Pollux	E.	54 40 7	3119	53 12 21	3120	51 44 36	3121	50 16 52	3123
	Saturn	E.	82 13 33	3066	80 44 42	3065	79 15 50	3064	77 46 56	3063
	Regulus	E.	90 18 18	3079	88 49 43	3079	87 21 8	3078	85 52 31	3077
16	Fomalhaut	W.	95 46 50	3275	97 11 31	3274	98 36 13	3273	100 0 56	3272
	α Pegasi	W.	79 48 26	3465	81 9 29	3460	82 30 38	3454	83 51 53	3450
	α Arietis	W.	36 11 32	3510	37 31 45	3480	38 52 32	3451	40 13 51	3425
	Pollux	E.	42 58 31	3128	41 30 55	3129	40 3 20	3131	38 35 48	3133
	Saturn	E.	70 22 0	3054	68 52 54	3052	67 23 45	3048	65 54 32	3045
	Regulus	E.	78 29 0	3067	77 0 10	3065	75 31 18	3063	74 2 23	3060
17	α Pegasi	W.	90 39 21	3430	92 1 4	3428	93 22 49	3426	94 44 36	3424
	α Arietis	W.	47 7 3	3323	48 30 48	3306	49 54 52	3291	51 19 14	3277
	Pollux	E.	31 19 0	3153	29 51 55	3161	28 24 59	3170	26 58 14	3181
	Saturn	E.	58 27 34	3030	56 57 59	3026	55 28 19	3023	53 58 35	3019
	Regulus	E.	66 36 57	3046	65 7 41	3042	63 38 20	3039	62 8 55	3034
18	α Arietis	W.	58 24 58	3215	59 50 49	3204	61 16 53	3193	62 43 10	3183
	Aldebaran	W.	25 38 37	3019	27 8 26	3014	28 38 22	3007	30 8 26	3002
	Saturn	E.	46 28 39	2998	44 58 24	2993	43 28 3	2989	41 57 36	2985
	Regulus	E.	54 40 37	3014	53 10 42	3010	51 40 42	3006	50 10 37	3001
19	α Arietis	W.	69 57 27	3138	71 24 51	3129	72 52 25	3120	74 20 10	3112
	Aldebaran	W.	37 40 29	2973	39 11 15	2967	40 42 9	2961	42 13 11	2954
	Saturn	E.	34 23 53	2959	32 52 49	2954	31 21 39	2949	29 50 22	2943
	Regulus	E.	42 38 44	2978	41 8 4	2973	39 37 17	2968	38 6 24	2963
	Spica	E.	96 36 47	3003	95 6 38	2997	93 36 21	2991	92 5 57	2985
20	α Arietis	W.	81 41 22	3073	83 10 5	3065	84 38 58	3057	86 8 0	3050
	Aldebaran	W.	49 50 19	2922	51 22 10	2916	52 54 9	2909	54 26 17	2901
	Regulus	E.	30 30 25	2938	28 58 54	2934	27 27 18	2929	25 55 36	2924
	Spica	E.	84 32 4	2954	83 0 54	2947	81 29 35	2941	79 58 8	2935

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			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
21	α Arietis	W.	87 37 11	3042	89 6 32	3034	90 36 2	3027	92 5 41	3020
	Aldebaran	W.	55 58 35	2894	57 31 2	2887	59 3 38	2879	60 36 24	2870
	Spica	E.	78 26 33	2927	76 54 49	2921	75 22 57	2914	73 50 56	2906
22	Aldebaran	W.	68 22 51	2830	69 56 40	2821	71 30 41	2811	73 4 54	2801
	Pollux	W.	24 54 1	2986	26 24 31	2960	27 55 34	2937	29 27 6	2916
	Spica	E.	66 8 30	2869	64 35 32	2862	63 2 25	2855	61 29 8	2846
	Sun	E.	134 50 2	3199	133 23 52	3189	131 57 30	3179	130 30 56	3168
23	Aldebaran	W.	80 59 8	2753	82 34 38	2743	84 10 21	2732	85 46 18	2720
	Pollux	W.	37 10 53	2828	38 44 44	2812	40 18 56	2797	41 53 28	2782
	Spica	E.	53 40 6	2807	52 5 47	2798	50 31 17	2791	48 56 37	2783
	Antares	E.	99 33 46	2795	97 59 12	2785	96 24 24	2774	94 49 22	2763
	Sun	E.	123 14 55	3114	121 47 3	3103	120 18 57	3091	118 50 37	3079
24	Aldebaran	W.	93 49 52	2663	95 27 21	2651	97 5 7	2638	98 43 10	2626
	Pollux	W.	49 50 59	2709	51 27 27	2695	53 4 13	2681	54 41 18	2666
	Saturn	W.	22 2 57	2657	23 40 35	2643	25 18 32	2629	26 56 47	2616
	Spica	E.	41 0 48	2747	39 25 11	2741	37 49 26	2735	36 13 33	2731
	Antares	E.	86 50 27	2704	85 13 53	2693	83 37 4	2681	81 59 59	2669
	Sun	E.	111 25 10	3017	109 55 18	3003	108 25 9	2989	106 54 42	2975
25	Pollux	W.	62 51 38	2594	64 30 41	2580	66 10 4	2564	67 49 48	2550
	Saturn	W.	35 12 37	2548	36 52 44	2533	38 33 11	2520	40 13 57	2506
	Regulus	W.	26 53 17	2581	28 32 38	2564	30 12 22	2548	31 52 28	2533
	Antares	E.	73 50 22	2606	72 11 35	2593	70 32 31	2580	68 53 9	2568
	Sun	E.	99 18 8	2904	97 45 54	2889	96 13 21	2874	94 40 29	2859
26	Pollux	W.	76 13 34	2475	77 55 22	2460	79 37 31	2445	81 20 1	2431
	Saturn	W.	48 42 46	2433	50 25 34	2418	52 8 43	2403	53 52 13	2389
	Regulus	W.	40 18 19	2456	42 0 34	2441	43 43 11	2426	45 26 9	2410
	Antares	E.	60 31 57	2504	58 50 50	2492	57 9 25	2480	55 27 43	2467
	Sun	E.	86 51 14	2782	85 16 22	2766	83 41 9	2750	82 5 35	2734
27	Pollux	W.	89 57 50	2356	91 42 28	2342	93 27 26	2328	95 12 45	2313
	Saturn	W.	62 35 2	2315	64 20 40	2300	66 6 39	2285	67 53 0	2271
	Regulus	W.	54 6 27	2335	55 51 36	2320	57 37 6	2305	59 22 58	2290
	Antares	E.	46 55 8	2413	45 11 52	2404	43 28 23	2396	41 44 42	2389
	Sun	E.	74 2 29	2655	72 24 48	2639	70 46 46	2624	69 8 23	2608
28	Saturn	W.	76 49 59	2201	78 38 25	2188	80 27 10	2175	82 16 15	2163
	Regulus	W.	68 17 37	2220	70 5 35	2207	71 53 52	2194	73 42 29	2181
	Sun	E.	60 51 13	2533	59 10 45	2519	57 29 58	2504	55 48 51	2492
29	Saturn	W.	91 26 18	2105	93 17 10	2094	95 8 19	2084	96 59 43	2075
	Regulus	W.	82 50 12	2122	84 40 37	2112	86 31 18	2102	88 22 14	2094
	Spica	W.	29 34 40	2260	31 21 39	2235	33 9 14	2213	34 57 22	2193
	Sun	E.	47 18 43	2429	45 35 49	2418	43 52 40	2408	42 9 16	2397
30	Regulus	W.	97 40 12	2054	99 32 22	2048	101 24 41	2042	103 17 9	2038
	Spica	W.	44 4 31	2121	45 54 58	2110	47 45 42	2101	49 36 40	2093
	Sun	E.	33 28 55	2356	31 44 17	2350	29 59 30	2344	28 14 35	2339

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21	α Arietis	W.	93° 35′ 29″	3013	95° 5′ 26″	3005	96° 35′ 33″	2997	98° 5′ 49″	2991
	Aldebaran	W.	62 9 21	2862	63 42 28	2855	65 15 45	2846	66 49 13	2838
	Spica	E.	72 18 45	2899	70 46 25	2892	69 13 56	2885	67 41 18	2877
22	Aldebaran	W.	74 39 20	2792	76 13 58	2783	77 48 48	2773	79 23 51	2763
	Pollux	W.	30 59 4	2897	32 31 27	2878	34 4 14	2861	35 37 23	2845
	Spica	E.	59 55 40	2838	58 22 2	2831	56 48 14	2822	55 14 15	2815
	Sun	E.	129 4 9	3158	127 37 10	3148	126 9 58	3137	124 42 33	3126
23	Aldebaran	W.	87 22 31	2709	88 58 59	2698	90 35 42	2687	92 12 39	2675
	Pollux	W.	43 28 20	2767	45 3 31	2753	46 39 1	2738	48 14 50	2723
	Spica	E.	47 21 47	2775	45 46 47	2768	44 11 37	2760	42 36 17	2753
	Antares	E.	93 14 5	2752	91 38 34	2740	90 2 47	2729	88 26 45	2716
	Sun	E.	117 22 2	3067	115 53 12	3055	114 24 7	3042	112 54 46	3030
24	Aldebaran	W.	100 21 30	2613	102 0 7	2600	103 39 2	2587	105 18 15	2574
	Pollux	W.	56 18 43	2652	57 56 27	2638	59 34 31	2623	61 12 55	2609
	Saturn	W.	28 35 20	2602	30 14 12	2589	31 53 22	2576	33 32 50	2562
	Spica	E.	34 37 34	2728	33 1 31	2726	31 25 25	2725	29 49 18	2727
	Antares	E.	80 22 37	2656	78 44 58	2644	77 7 3	2632	75 28 51	2619
	Sun	E.	105 23 58	2962	103 52 57	2948	102 21 39	2934	100 50 3	2919
25	Pollux	W.	69 29 52	2535	71 10 16	2520	72 51 1	2505	74 32 7	2490
	Saturn	W.	41 55 2	2492	43 36 27	2477	45 18 13	2462	47 0 19	2448
	Regulus	W.	33 32 55	2517	35 13 44	2502	36 54 54	2487	38 36 26	2472
	Antares	E.	67 13 30	2555	65 33 33	2543	63 53 19	2530	62 12 47	2517
	Sun	E.	93 7 18	2844	91 33 47	2828	89 59 56	2813	88 25 45	2798
26	Pollux	W.	83 2 52	2416	84 46 4	2401	86 29 38	2386	88 13 33	2371
	Saturn	W.	55 36 4	2374	57 20 16	2359	59 4 50	2344	60 49 45	2329
	Regulus	W.	47 9 29	2395	48 53 11	2380	50 37 15	2365	52 21 40	2350
	Antares	E.	53 45 44	2456	52 3 29	2444	50 20 57	2433	48 38 10	2423
	Sun	E.	80 29 40	2718	78 53 24	2702	77 16 47	2687	75 39 49	2670
27	Pollux	W.	96 58 25	2299	98 44 26	2285	100 30 47	2272	102 17 28	2259
	Saturn	W.	69 39 42	2257	71 26 45	2243	73 14 9	2229	75 1 54	2215
	Regulus	W.	61 9 12	2276	62 55 47	2262	64 42 43	2247	66 30 0	2234
	Antares	E.	40 0 51	2382	38 16 51	2378	36 32 44	2374	34 48 32	2372
	Sun	E.	67 29 39	2593	65 50 34	2577	64 11 8	2562	62 31 21	2547
28	Saturn	W.	84 5 39	2150	85 55 22	2138	87 45 23	2126	89 35 42	2115
	Regulus	W.	75 31 25	2169	77 20 40	2157	79 10 13	2145	81 0 4	2134
	Sun	E.	54 7 26	2478	52 25 42	2465	50 43 40	2453	49 1 20	2441
29	Saturn	W.	98 51 21	2066	100 43 13	2057	102 35 18	2050	104 27 35	2042
	Regulus	W.	90 13 23	2084	92 4 46	2075	93 56 23	2068	95 48 12	2061
	Spica	W.	36 46 0	2176	38 35 4	2160	40 24 32	2145	42 14 22	2133
	Sun	E.	40 25 37	2388	38 41 45	2379	36 57 40	2371	35 13 23	2363
30	Regulus	W.	105 9 44	3034	107 2 25	2031	108 55 11	2028	110 48 1	2026
	Spica	W.	51 27 50	2086	53 19 11	2080	55 10 41	2075	57 2 19	2070
	Sun	E.	26 29 32	2335	24 44 23	2332	22 59 10	2330	21 13 54	2328

GREENWICH MEAN TIME.

JANUARY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	18 1 50.82	+16 948	−24 18 41.5	−14.56	23 22.3
2	18 8 38.63	17.035	24 23 52.3	11.34	23 25.2
3	18 15 28.48	17.118	24 27 45.2	8.06	23 28.1
4	18 22 20.24	17.195	24 30 19.0	4.75	23 31.1
5	18 29 13.81	17.268	24 31 32.6	− 1.38	23 34.1
6	18 36 9.07	+17.336	−24 31 24.6	+ 2.05	23 37.1
7	18 43 5.92	17.400	24 29 54.0	5.52	23 40.1
8	18 50 4.25	17.460	24 26 59.6	9.03	23 43.2
9	18 57 3.95	17.515	24 22 40.3	12.58	23 46.2
10	19 4 4.90	17.565	24 16 55.2	16.18	23 49.3
11	19 11 7.01	+17.611	−24 9 43.3	+19.82	23 52.5
12	19 18 10.16	17.652	24 1 3.6	23.49	23 55.6
13	19 25 14.24	17.688	23 50 55.4	27.20	23 58.7
14	19 32 19.13	17.719	23 39 17.7	30.94	
15	19 39 24.71	17.745	23 26 9.9	34.72	0 1.9
16	19 46 30.86	+17.766	−23 11 31.1	+38.52	0 5.1
17	19 53 37.46	17.782	22 55 20.7	42.35	0 8.2
18	20 0 44.38	17.793	22 37 38.1	46.20	0 11.4
19	20 7 51.48	17.798	22 18 23.0	50.07	0 14.6
20	20 14 58.63	17.797	21 57 34.9	53.95	0 17.8
21	20 22 5.70	+17.791	−21 35 13.3	+57.85	0 21.0
22	20 29 12.53	17.777	21 11 18.0	61.75	0 24.1
23	20 36 18.94	17.756	20 45 49.2	65.65	0 27.3
24	20 43 24.76	17.723	20 18 46.9	69.54	0 30.5
25	20 50 29.80	17.691	19 50 11.2	73.42	0 33.6
26	20 57 33.82	+17.643	−19 20 2.9	+77.27	0 36.8
27	21 4 36.56	17.584	18 48 22.7	81.07	0 39.9
28	21 11 37.75	17.513	18 15 11.8	84.83	0 42.9
29	21 18 37.07	17.428	17 40 31.5	88.51	0 46.0
30	21 25 34.16	17.327	17 4 24.1	92.09	0 49.0
31	21 32 28.59	+17.206	−16 26 52.0	+95.57	0 52.0
32	21 39 19.85	+17.062	−15 47 58.1	+98.90	0 54.9

FEBRUARY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	21 39 19.85	+17.062	−15 47 58.1	+ 98.90	0 54.9
2	21 46 7.36	16.894	15 7 46.4	102.04	0 57.7
3	21 52 50.53	16.698	14 26 21.8	104.97	1 0.5
4	21 59 28.57	16.466	13 43 49.8	107.65	1 3.2
5	22 6 0.57	16.194	13 0 17.2	110.01	1 5.8
6	22 12 25 53	+15.878	−12 15 52.3	+112.00	1 8.3
7	22 18 42.33	15.512	11 30 41.5	113.57	1 10.6
8	22 24 49.66	15.089	10 45 5.0	114.64	1 12.8
9	22 30 46.08	14.601	9 59 6.5	115.14	1 14.8
10	22 36 29.95	14.042	9 13 3.5	115.00	1 16.6
11	22 41 59.48	+13.406	− 8 27 12.4	+114.14	1 18.1
12	22 47 12.77	12.686	7 41 51.3	112.48	1 19.4
13	22 52 7.72	11.878	6 57 20.1	109.97	1 20.3
14	22 56 42.16	10.977	6 14 0.3	106.52	1 20.9
15	23 0 53.83	9.980	5 32 14.8	102.10	1 21.2
16	23 4 40.46	+ 8.890	− 4 52 27.4	+ 96.68	1 21.0
17	23 7 59.84	7.710	4 15 2.4	90.23	1 20.3
18	23 10 49.87	6.444	3 40 24.5	82.76	1 19.2
19	23 13 8.60	5.105	3 8 57.9	74.29	1 17.5
20	23 14 54.43	3.704	2 41 5.9	64.88	1 15.3
21	23 16 6.04	+ 2.257	− 2 17 10.2	+ 54.62	1 12.5
22	23 16 42.60	+ 0.787	1 57 30.0	43.61	1 9.2
23	23 16 43.83	− 0.682	1 42 21.6	31.99	1 5.2
24	23 16 10.07	2.124	1 31 57.8	19.94	1 0.7
25	23 15 2.33	3.508	1 26 26.3	+ 7.66	0 55.7
26	23 13 22.38	− 4.804	− 1 25 49.9	− 4.61	0 50.1
27	23 11 12.72	5.978	1 30 5.3	16.61	0 44.0
28	23 8 36.61	7.003	1 39 2.8	28.04	0 37.4
29	23 5 37.99	7.850	1 52 26.4	38.75	0 30.5
30	23 2 21.36	8.500	2 9 53.2	48.31	0 23.3
31	22 58 51.66	− 8.938	− 2 30 54.9	− 56.60	0 15.9
32	22 55 14.06	− 9.158	− 2 54 58.2	− 63.42	0 8.4

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.
Semidiameter . .	″2.4	″2.4	″2.3	″2.3	″2.4	″2.4	″2.5
Hor. Parallax . .	6.3	6.2	6.2	6.2	6.3	6.5	6.8

Day of the Month.	5th.	10th.	15th.	20th.	25th.
Semidiameter.	″2.7	″3.0	″3.4	″4.0	″4.6
Horizontal Parallax . .	7.2	7.9	9.0	10.5	12.2

NOTE.—The sign + indicates north declinations: the sign — indicates south declinations.

GREENWICH MEAN TIME.

MARCH.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	23 2 21.36	− 8.500	−2 9 53.2	−48.31	0 23.3
2	22 58 51.66	8.938	2 30 54.9	56.60	0 15.9
3	22 55 14.06	9.158	2 54 58.2	63.42	0 8.4
4	22 51 33.81	9.160	3 21 26.6	68.67	0 0.9 / 23 53.3
5	22 47 56.01	8.956	3 49 41.3	72.29	23 45.9
6	22 44 25.40	− 8.564	−4 19 3.7	−74.31	23 38.7
7	22 41 6.27	8.005	4 48 56.1	74.82	23 31.7
8	22 38 2.31	7.304	5 18 43.8	73.94	23 25.0
9	22 35 16.59	6.487	5 47 55.2	71.82	23 18.7
10	22 32 51.50	5.591	6 16 3.1	68.68	23 12.7
11	22 30 48.69	− 4.635	−6 42 45.3	−64.70	23 7.1
12	22 29 9.32	3.642	7 7 43.3	60.04	23 1.9
13	22 27 53.99	2.635	7 30 43.0	54.87	22 57.1
14	22 27 2.84	1.630	7 51 34.3	49.35	22 52.7
15	22 26 35.64	− 0.641	8 10 10.0	43.58	22 48.7
16	22 26 31.88	+ 0.322	−8 26 25.3	−37.68	22 45.1
17	22 26 50.81	1.249	8 40 18.3	31.74	22 41.8
18	22 27 31.52	2.136	8 51 48.7	25.80	22 38.9
19	22 28 33.00	2.979	9 0 57.2	19.92	22 36.3
20	22 29 54.18	3.778	9 7 45.7	14.14	22 34.0
21	22 31 33.99	+ 4.531	−9 12 16.8	− 8.48	22 32.0
22	22 33 31.31	5.238	9 14 33.5	− 2.94	22 30.2
23	22 35 45.08	5.902	9 14 39.1	+ 2.44	22 28.8
24	22 38 14.25	6.523	9 12 37.2	7.68	22 27.6
25	22 40 57.84	7.103	9 8 31.7	12.76	22 26.6
26	22 43 54.89	+ 7.645	−9 2 26.0	+17.69	22 25.8
27	22 47 4.52	8.152	8 54 23.8	22.47	22 25.1
28	22 50 25.92	8.626	8 44 28.7	27.10	22 24.7
29	22 53 58.32	9.069	8 32 43.9	31.61	22 24.5
30	22 57 41.02	9.485	8 19 12.7	35.97	22 24.4
31	23 1 33.37	+ 9.874	−8 3 58.4	+40.20	22 24.5
32	23 5 34.77	+10.240	−7 47 4.0	+44.31	22 24.7

APRIL.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	23 5 34.77	+10.240	− 7 47 4.0	+ 44.31	22 24.7
2	23 9 44.70	10.585	7 28 32.3	48.31	22 25.0
3	23 14 2.67	10.910	7 8 26.0	52.20	22 25.5
4	23 18 28.23	11.218	6 46 47.7	55.97	22 26.1
5	23 23 1.00	11.511	6 23 40.2	59.64	22 26.8
6	23 27 40.64	+11.790	− 5 59 5.7	+ 63.22	22 27.6
7	23 32 26.85	12.058	5 33 6.6	66.70	22 28.6
8	23 37 19.37	12.317	5 5 45.0	70.08	22 29.6
9	23 42 17.96	12.566	4 37 3.2	73.38	22 30.7
10	23 47 22.46	12.808	4 7 3.1	76.61	22 31.9
11	23 52 32.72	+13.045	− 3 35 46.7	+ 79.75	22 33.3
12	23 57 48.60	13.278	3 3 15.9	82.80	22 34.7
13	0 3 10.04	13.508	2 29 32.8	85.78	22 36.2
14	0 8 36.99	13.738	1 54 39.3	88.67	22 37.8
15	0 14 9.43	13.965	1 18 37.2	91.49	22 39.4
16	0 19 47.35	+14.195	− 0 41 28.2	+ 94.24	22 41.2
17	0 25 30.81	14.427	− 0 3 14.4	96.90	22 43.1
18	0 31 19.88	14.663	+ 0 36 2.5	99.49	22 45.1
19	0 37 14.65	14.902	1 16 20.4	101.99	22 47.2
20	0 43 15.23	15.147	1 57 37.3	104.40	22 49.3
21	0 49 21.76	+15.398	+ 2 39 51.0	+106.72	22 51.6
22	0 55 34.40	15.657	3 22 59.3	108.95	22 54.0
23	1 1 53.35	15.924	4 6 59.7	111.07	22 56.4
24	1 8 18.81	16.200	4 51 49.7	113.08	22 59.0
25	1 14 51.00	16.484	5 37 26.4	114.96	23 1.7
26	1 21 30.13	+16.779	+ 6 23 46.6	+116.70	23 4.6
27	1 28 16.46	17.084	7 10 46.7	118.28	23 7.6
28	1 35 10.23	17.399	7 58 22.9	119.70	23 10.6
29	1 42 11.68	17.724	8 46 30.9	120.93	23 13.8
30	1 49 21.06	18.059	9 35 5.8	121.94	23 17.2
31	1 56 38.57	+18.402	+10 24 2.2	+122.72	23 20.7
32	2 4 4.40	+18.752	+11 13 14.1	+123.22	23 24.3

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.
Semidiameter . .	5″.2	5″.4	5″.2	4″.9	4″.5	4″.1	3″.8
Hor. Parallax . .	13.7	14.3	13.9	12.9	11.8	10.8	9.9

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.
Semidiameter . .	3″.5	3″.2	3″.0	2″.8	2″.7	2″.6
Hor. Parallax . .	9.2	8.5	8.0	7.6	7.2	6.9

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign − indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

MAY.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m
1	1 56 38.57	+18.402	+10 24 2.2	+122.72	23 20.7
2	2 4 4.40	18.752	11 13 14.1	123.22	23 24.3
3	2 11 38.71	19.108	12 2 34.4	123.42	23 28.1
4	2 19 21.59	19.466	12 51 55.5	123.29	23 32.0
5	2 27 13.08	19.825	13 41 9.5	122.80	23 36.1
6	2 35 13.14	+20.179	+14 30 6.7	+121.90	23 40.3
7	2 43 21.62	20.525	15 18 37.2	120.57	23 44.9
8	2 51 38.24	20.858	16 6 30.2	118.77	23 49.1
9	3 0 2.65	21.173	16 53 34.2	116.48	23 53.7
10	3 8 34.33	21.462	17 39 37.1	113.68	23 58.4
11	3 17 12.61	+21.722	+18 24 26.5	+110.35	
12	3 25 56.69	21.944	19 7 49.9	106.51	0 3.2
13	3 34 45.61	22.125	19 49 35.1	102.17	0 8.1
14	3 43 38.34	22.260	20 29 30.2	97.34	0 13.0
15	3 52 33.68	22.343	21 7 24.1	92.07	0 18.0
16	4 1 30.40	+22.374	+21 43 6.5	+ 86.41	0 23.1
17	4 10 27.19	22.349	22 16 29.0	80.41	0 28.1
18	4 19 22.71	22.268	22 47 24.2	74.14	0 33.1
19	4 28 15.64	22.133	23 15 46.3	67.68	0 38.0
20	4 37 4.68	21.945	23 41 31.7	61.09	0 42.9
21	4 45 48.62	+21.708	+24 4 38.1	+ 54.44	0 47.7
22	4 54 26.29	21.424	24 25 4.7	47.78	0 52.4
23	5 2 56.62	21.097	24 42 52.1	41.19	0 57.0
24	5 11 18.62	20.730	24 58 2.6	34.71	1 1.4
25	5 19 31.40	20.329	25 10 39.2	28.38	1 5.7
26	5 27 34.18	+19.898	+25 20 46.1	+ 22.23	1 9.8
27	5 35 26.26	19.438	25 28 28.1	16.31	1 13.8
28	5 43 7.02	18.954	25 33 50.7	10.62	1 17.5
29	5 50 35.90	18.449	25 36 59.9	5.19	1 21.0
30	5 57 52.43	17.925	25 38 1.9	+ 0.02	1 24.3
31	6 4 56.18	+17.384	+25 37 3.3	− 4.86	1 27.4
32	6 11 46.76	+16.828	+25 34 10.6	− 9.48	1 30.3

JUNE.

Day of Month.	Apparent Right Ascension.	Var. of R. A for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m
1	6 11 46.76	+16.828	+25 34 10.6	− 9.48	1 30.3
2	6 18 23.82	16.258	25 29 30.7	13.80	1 33.0
3	6 24 47.04	15.675	25 23 10.3	17.85	1 35.5
4	6 30 56.14	15.081	25 15 16.1	21.62	1 37.7
5	6 36 50.83	14.475	25 5 54.8	25.11	1 39.6
6	6 42 30.83	+13.857	+24 55 13.1	−28.33	1 41.3
7	6 47 55.90	13.228	24 43 17.5	31.27	1 42.8
8	6 53 5.75	12.589	24 30 14.5	33.94	1 44.0
9	6 58 0.14	11.939	24 16 10.6	36.35	1 45.0
10	7 2 38.76	11.276	24 1 12.0	38.50	1 45.6
11	7 7 1.31	+10.601	+23 45 25.0	−40.38	1 46.0
12	7 11 7.52	9.914	23 28 55.9	42.00	1 46.2
13	7 14 57.08	9.214	23 11 50.8	43.38	1 46.0
14	7 18 29.68	8.500	22 54 15.8	44.50	1 45.6
15	7 21 44.99	7.773	22 36 17.0	45.36	1 44.9
16	7 24 42.67	+ 7.032	+22 18 0.4	−45.98	1 43.9
17	7 27 22.40	6.277	21 59 32.1	46.34	1 42.6
18	7 29 43.88	5.510	21 40 58.2	46.45	1 41.0
19	7 31 46.78	4.730	21 22 24.7	46.31	1 39.1
20	7 33 30.81	3.938	21 3 57.5	45.92	1 36.9
21	7 34 55.72	+ 3.137	+20 45 42.6	−45.28	1 34.3
22	7 36 1.31	2.328	20 27 46.0	44.39	1 31.4
23	7 36 47.43	1.515	20 10 13.7	43.26	1 28.2
24	7 37 14.04	+ 0.702	19 53 11.7	41.87	1 24.7
25	7 37 21.15	− 0.108	19 36 45.7	40.25	1 20.9
26	7 37 8.93	− 0.908	+19 21 1.4	−38.40	1 16.8
27	7 36 37.67	1.693	19 6 4.4	36.31	1 12.3
28	7 35 47.86	2.454	18 52 0.1	34.01	1 7.5
29	7 34 40.14	3.183	18 38 53.5	31.50	1 2.5
30	7 33 15.38	3.872	18 26 49.8	28.79	0 57.1
31	7 31 34.66	− 4.512	+18 15 53.0	−25.91	0 51.5
32	7 29 39.29	− 5.091	+18 6 7.4	−22.86	0 45.7

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.
Semidiameter . .	″2.5	″2.5	″2.6	″2.7	″2.9	″3.2
Hor. Parallax . .	6.7	6.7	6.8	7.1	7.7	8.4

Day of the Month.	4th.	9th.	14th.	19th.	24th.	29th.
Semidiameter . .	″3.5	″3.9	″4.3	″4.8	″5.2	″5.6
Hor. Parallax . .	9.2	10.2	11.3	12.6	13.8	14.9

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

JULY.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m
1	7 31 34.66	− 4.512	+18 15 53.0	−25.91	0 51.5
2	7 29 39.29	5.091	18 6 7.4	22.86	0 45.7
3	7 27 30.87	5.599	17 57 36.6	19.68	0 39.6
4	7 25 11.17	6.026	17 50 23.6	16.38	0 33.3
5	7 22 42.25	6.365	17 44 30.9	13.00	0 26.9
6	7 20 6.34	− 6.608	+17 40 0.2	− 9.55	0 20.4
7	7 17 25.88	6.746	17 36 52.6	6.03	0 13.8
8	7 14 43.41	6.774	17 35 8.4	− 2.61	0 7.2
9	7 12 1.61	6.690	17 34 47.1	+ 0.88	0 0.6 / 23 54.0
10	7 9 23.17	6.495	17 35 47.6	4.21	23 47.6
11	7 6 50.75	− 6.188	+17 38 8.2	+ 7.49	23 41.3
12	7 4 26.99	5.774	17 41 46.0	10.63	23 35.2
13	7 2 14.42	5.257	17 46 37.3	13.62	23 29.3
14	7 0 15.41	4.645	17 52 38.2	16.42	23 23.6
15	6 58 32.13	3.947	17 59 44.0	19.02	23 18 2
16	6 57 6 56	− 3.172	+18 7 49.0	+21.37	23 13.2
17	6 56 0.43	2.328	18 16 47.5	23.46	23 8.5
18	6 55 15.28	1.425	18 26 32.7	25.27	23 4.2
19	6 54 52.40	− 0.474	18 36 57.5	26.76	23 0.3
20	6 54 52.85	+ 0.516	18 47 54.3	27.93	22 56.7
21	6 55 17.48	+ 1.540	+18 59 15.2	+28.75	22 53.6
22	6 56 6.97	2.587	19 10 51.5	29.21	22 50.9
23	6 57 21.80	3.651	19 22 34.4	29.29	22 48.6
24	6 59 2.31	4.726	19 34 14.5	28.98	22 46.7
25	7 1 8.67	5.805	19 45 42.3	28.26	22 45.3
26	7 3 40.94	+ 6.884	+19 56 47.5	+27.11	22 44.3
27	7 6 39.08	7.959	20 7 19.9	25.51	22 43.7
28	7 10 2.88	9.023	20 17 8.5	23.46	22 43.6
29	7 13 52.05	10.072	20 26 2.1	20.94	22 43.9
30	7 18 6.17	11.101	20 33 49.8	17.95	22 44.6
31	7 22 44.71	+12.106	+20 40 20.1	+14.49	22 45.7
32	7 27 47.03	+13.081	+20 45 21.5	+10.55	22 47.1

AUGUST.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m
1	7 27 47.03	+13.081	+20 45 21.5	+ 10.55	22 47.1
2	7 33 12.32	14.020	20 48 42.8	6.15	22 48.9
3	7 38 59.65	14.916	20 50 12.9	+ 1.29	22 51.1
4	7 45 7.90	15.763	20 49 41.2	− 4.00	22 53.6
5	7 51 35.85	16.555	20 46 57.9	9.68	22 56.4
6	7 58 22.02	+17.283	+20 41 54.1	− 15.70	22 59.5
7	8 5 24.89	17.943	20 34 22.2	22.00	23 2.9
8	8 12 42.70	18.528	20 24 16.3	28.53	23 6.5
9	8 20 13.62	19.035	20 11 31.7	35.20	23 10.2
10	8 27 55.71	19.459	19 56 6.1	41.94	23 14.1
11	8 35 46.98	+19.799	+19 37 59.0	− 48.65	23 18.2
12	8 43 45.42	20.057	19 17 12.0	55.25	23 22.3
13	8 51 49.07	20.234	18 53 48.2	61.68	23 26.5
14	8 59 56.05	20.335	18 27 53.1	67.86	23 30.7
15	9 8 4.59	20.365	17 59 33.3	73.74	23 34.9
16	9 16 13.04	+20.330	+17 28 56.4	− 79.26	23 39.1
17	9 24 19.96	20.238	16 56 12.0	84.38	23 43.2
18	9 32 24.08	20.097	16 21 29.5	89.10	23 47.3
19	9 40 24.32	19.916	15 44 58.7	93.39	23 51.3
20	9 48 19.77	19.700	15 6 50.1	97.26	23 55.2
21	9 56 9.71	+19.458	+14 27 13.6	−100.71	23 59.0
22	10 3 53.58	19.196	13 46 19.1	103.77	
23	10 11 30.96	18.918	13 4 15.8	106.44	0 2.7
24	10 19 1.59	18.632	12 21 12.8	108.75	0 6.3
25	10 26 25.27	18.341	11 37 18.4	110.73	0 9.7
26	10 33 41.95	+18.048	+10 52 40.4	−112.38	0 13.1
27	10 40 51.61	17.757	10 7 26.2	113.75	0 16.3
28	10 47 54.32	17.469	9 21 42.3	114.86	0 19.4
29	10 54 50.19	17.188	8 35 34.7	115.72	0 22.4
30	11 1 39.39	16.913	7 49 9.0	116.37	0 25.3
31	11 8 22.08	+16.646	+ 7 2 30.4	−116.82	0 28.0
32	11 14 58.48	+16.388	+ 6 15 43.3	−117.07	0 30.7

Day of the Month.	4th.	9th.	14th.	19th.	24th.	29th.
Semidiameter . .	″ 5.9	″ 5.8	″ 5.5	″ 5.0	″ 4.4	″ 3.8
Hor. Parallax . .	15.5	15.4	14.6	13.2	11.6	10.1

Day of the Month.	3d.	8th.	13th.	18th.	23d.	28th.
Semidiameter . .	″ 3.3	″ 3.0	″ 2.7	″ 2.5	″ 2.5	″ 2.4
Hor Parallax . .	8.8	7.8	7.2	6.7	6.5	6.4

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign − indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

SEPTEMBER.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon*	*Noon.*	
	h m s	s	° ′ ″	″	h m
1	11 14 58.48	+16.336	+ 6 15 43.3	−117.07	0 30.7
2	11 21 28.81	16.140	5 28 52.2	117.16	0 33.3
3	11 27 53.29	15.902	4 42 0.7	117.10	0 35.7
4	11 34 12.16	15.673	3 55 12.5	116.90	0 38.1
5	11 40 25.65	15.453	3 8 30.7	116.57	0 40.4
6	11 46 33.98	+15.243	+ 2 21 58.2	−116.12	0 42.6
7	11 52 37.38	15.042	1 35 37.8	115.56	0 44.7
8	11 58 36.08	14.850	0 49 32.1	114.90	0 46.8
9	12 4 30.28	14.667	+ 0 3 43.4	114.14	0 48.7
10	12 10 20.17	14.492	− 0 41 46.1	113.31	0 50.6
11	12 16 5.96	+14.325	− 1 26 54.7	−112.40	0 52.4
12	12 21 47.82	14.165	2 11 40.6	111.41	0 54.2
13	12 27 25.92	14.011	2 56 1.6	110.34	0 55.9
14	12 33 0.39	13.863	3 39 55.8	109.19	0 57.5
15	12 38 31.38	13.721	4 23 21.7	107.97	0 59.1
16	12 43 59.02	+13.583	− 5 6 17.7	−106.69	1 0.6
17	12 49 23.41	13.450	5 48 42.3	105.35	1 2.1
18	12 54 44.64	13.320	6 30 33.9	103.94	1 3.5
19	13 0 2.77	13.192	7 11 50.9	102.47	1 4.8
20	13 5 17.87	13.066	7 52 31.8	100.93	1 6.1
21	13 10 29.96	+12.942	− 8 32 35.0	− 99.33	1 7.4
22	13 15 39.06	12.817	9 11 59.1	97.66	1 8.6
23	13 20 45.17	12.691	9 50 42.2	95.92	1 9.7
24	13 25 48.23	12.563	10 28 42.7	94.11	1 10.8
25	13 30 48.18	12.432	11 5 59.0	92.23	1 11.9
26	13 35 44.92	+12.296	−11 42 29.1	− 90.27	1 12.9
27	13 40 38.34	12.154	12 18 11.2	88.22	1 13.9
28	13 45 28.27	12.005	12 53 3.2	86.09	1 14.8
29	13 50 14.50	11.846	13 27 3.0	83.87	1 15.6
30	13 54 56.78	11.675	14 0 8.2	81.55	1 16.3
31	13 59 34.81	+11.491	−14 32 16.5	− 79.12	1 17.0
32	14 4 8.22	+11.291	−15 3 24.9	− 76.57	1 17.6

OCTOBER.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m
1	13 59 34.81	+11.491	−14 32 16.5	− 79.12	1 17.0
2	14 4 8.22	11.291	15 3 24.9	76.57	1 17.6
3	14 8 36.63	11.073	15 33 30.8	73.90	1 18.2
4	14 12 59.51	10.833	16 2 30.9	71.09	1 18.6
5	14 17 16.40	10.568	16 30 21.8	68.12	1 18.9
6	14 21 26.58	+10.275	−16 56 59.6	− 65.00	1 19.1
7	14 25 29.35	9.950	17 22 20.3	61.70	1 19.2
8	14 29 23.90	9.589	17 46 19.4	58.19	1 19.2
9	14 33 9.28	9.186	18 8 51.7	54.46	1 19.0
10	14 36 44.44	8.737	18 29 51.6	50.49	1 18.6
11	14 40 8.22	+ 8.235	−18 49 13.1	− 46.25	1 18.1
12	14 43 19.28	7.677	19 6 49.3	41.71	1 17.3
13	14 46 16.19	7.054	19 22 32.3	36.82	1 16.3
14	14 48 57.32	6.361	19 36 13.7	31.56	1 15.0
15	14 51 20.91	5.592	19 47 44.0	25.89	1 13.5
16	14 53 25.05	+ 4.739	−19 56 52.6	− 19.74	1 11.6
17	14 55 7.69	3.800	20 3 27.5	13.08	1 9.4
18	14 56 26.70	2.769	20 7 16.3	− 5.88	1 6.7
19	14 57 19.85	1.645	20 8 5.0	+ 1.93	1 3.6
20	14 57 44.93	+ 0.430	20 5 38.6	10.38	1 0.1
21	14 57 39.82	− 0.869	−19 59 41.7	+ 19.48	0 56.1
22	14 57 2.64	2.240	19 49 58.6	29.22	0 51.5
23	14 55 51.87	3.664	19 36 14.7	39.54	0 46.4
24	14 54 6.59	5.110	19 18 17.2	50.32	0 40.7
25	14 51 46.70	6.541	18 55 57.2	61.39	0 34.4
26	14 48 53.13	− 7.908	−18 29 11.3	+ 72.42	0 27.6
27	14 45 28.11	9.152	17 58 4.7	83.05	0 20.3
28	14 41 35.30	10.212	17 22 52.6	92.77	0 12.5
29	14 37 19.90	11.024	16 44 3.7	101.02	{ 0 4.3 / 23 55.9 }
30	14 32 48.57	11.530	16 2 19.9	107.23	23 47.4
31	14 28 9.20	−11.689	−15 18 36.9	+110.87	23 38.9
32	14 23 30.44	−11.476	−14 34 1.7	+111.53	23 30.5

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.
Semidiameter . . .	″ 2.4	″ 2.5	″ 2.5	″ 2.6	″ 2.7	″ 2.8
Horizontal Parallax	6.5	6.5	6.7	6.9	7.2	7.6

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.
Semidiameter . .	″ 3.0	″ 3.3	″ 3.6	″ 4.0	″ 4.4	″ 4.9
Hor. Parallax . .	8.0	8.7	9.5	10.5	11.8	12.9

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

NOVEMBER.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m
1	14 23 30.44	−11.476	−14 34 1.7	+111.53	23 30.5
2	14 19 1.29	10.892	13 49 48.7	109.01	23 22.3
3	14 14 50.37	9.962	13 7 14.3	103.34	23 14.8
4	14 11 5.46	8.734	12 27 31.3	94.79	23 7.6
5	14 7 53.02	7.269	11 51 43.6	83.82	23 1.0
6	14 5 17.88	− 5.637	−11 20 42.2	+ 71.05	22 55.1
7	14 3 23.22	3.909	10 55 2.5	57.12	22 50.0
8	14 2 10.53	2.148	10 35 4.9	42.64	22 45.6
9	14 1 39.96	− 0.409	10 20 55.6	28.18	22 41.8
10	14 1 50.39	+ 1.264	10 12 28.5	14.19	22 38.6
11	14 2 39.86	+ 2.840	−10 9 28.4	+ 0.98	22 36.0
12	14 4 5.82	4.302	10 11 33.1	− 11.18	22 34.0
13	14 6 5.37	5.638	10 18 16.1	22.19	22 32.6
14	14 8 35.45	6.846	10 29 8.7	31.99	22 31.6
15	14 11 32.98	7.928	10 43 41.7	40.57	22 31.0
16	14 14 55.03	+ 8.890	−11 1 26.5	− 47.97	22 30.8
17	14 18 38.82	9.742	11 21 55.5	54.27	22 30.8
18	14 22 41.82	10.492	11 44 43.3	59.55	22 31.2
19	14 27 1.74	11.153	12 9 26.2	63.89	22 31.9
20	14 31 36.52	11.733	12 35 43.2	67.40	22 32.7
21	14 36 24.35	+12.243	−13 3 15.2	− 70.15	22 33.7
22	14 41 23.68	12.692	13 31 45.1	72.24	22 34.9
23	14 46 33.15	13.089	14 0 58.0	73.74	22 36.3
24	14 51 51.57	13.439	14 30 40.4	74.72	22 37.8
25	14 57 17.91	13.750	15 0 40.5	75.23	22 39.4
26	15 2 51.32	+14.029	−15 30 48.3	− 75.35	22 41.1
27	15 8 31.06	14.278	16 0 54.6	75.12	22 42.9
28	15 14 16.47	14.502	16 30 51.5	74.57	22 44.8
29	15 20 7.01	14.707	17 0 31.8	73.74	22 46.8
30	15 26 2.25	14.894	17 29 49.3	72.68	22 48.8
31	15 32 1.81	+15.067	−17 58 38.6	− 71.40	22 50.9
32	15 38 5.34	+15.227	−18 26 54.8	− 69.92	22 53.1

DECEMBER.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m
1	15 32 1.81	+15.067	−17 58 38.6	−71.40	22 50.9
2	15 38 5.34	15.227	18 26 54.8	69.92	22 53.1
3	15 44 12.59	15.376	18 54 33.6	68.28	22 55.4
4	15 50 23.30	15.516	19 21 30.8	66.47	22 57.7
5	15 56 37.28	15.648	19 47 43.2	64.54	23 0.0
6	16 2 54.36	+15 774	−20 13 7.5	−62.47	23 2.4
7	16 9 14.39	15.894	20 37 40.6	60.28	23 4.8
8	16 15 37.25	16.010	21 1 20.2	58.00	23 7.3
9	16 22 2.84	16.122	21 24 3.7	55.61	23 9.9
10	16 28 31.06	16.230	21 45 48.7	53.13	23 12.4
11	16 35 1.84	+16.335	−22 6 33.2	−50.57	23 15.0
12	16 41 35.10	16.436	22 26 15.3	47.92	23 17.7
13	16 48 10.75	16.535	22 44 53.0	45.20	23 20.4
14	16 54 48.75	16.632	23 2 24.5	42.41	23 23.1
15	17 1 29.04	16.726	23 18 48.2	39.55	23 25.9
16	17 8 11.55	+16.817	−23 34 2.4	−36.62	23 28.7
17	17 14 56.23	16.906	23 48 5.4	33.63	23 31.5
18	17 21 43.01	16.993	24 0 56.0	30.58	23 34.4
19	17 28 31.86	17.077	24 12 32.6	27.46	23 37.3
20	17 35 22.69	17.158	24 22 53.7	24.28	23 40.3
21	17 42 15.43	+17.236	−24 31 57.8	−21.05	23 43.3
22	17 49 10.00	17.311	24 39 43.7	17.76	23 46.3
23	17 56 6.34	17.384	24 46 10.1	14.42	23 49.3
24	18 3 4.38	17.452	24 51 15.6	11.02	23 52.3
25	18 10 3.99	17.516	24 54 58.9	7.58	23 55.4
26	18 17 5.12	+17.577	−24 57 18.8	− 4.08	23 58.5
27	18 24 7.64	17.632	24 58 14.1	− 0.52	
28	18 31 11.42	17.683	24 57 43.6	+ 3.08	0 1.7
29	18 38 16.38	17.730	24 55 46.1	6.73	0 4.8
30	18 45 22.40	17.771	24 52 20.6	10.42	0 8.0
31	18 52 29.34	+17.806	−24 47 26.0	+14.15	0 11.1
32	18 59 37.02	+17.834	−24 41 1.3	+17.92	0 14.3

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.
Semidiameter . .	″ 4.9	″ 4.6	″ 3.9	″ 3.4	″ 3.1	″ 2.8
Hor. Parallax . .	13.1	12.0	10.4	9.0	8.0	7.4

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.
Semidiameter . .	″ 2.6	″ 2.5	″ 2.4	″ 2.3	″ 2.3	″ 2.3	″ 2.3
Hor. Parallax . .	6.8	6.6	6.3	6.2	6.1	6.1	6.2

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

JANUARY.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m
1	15 37 43.87	+11.625	−16 40 9.5	−42.44	20 56.1
2	15 42 23.60	11.685	16 56 58.5	41.65	20 56.8
3	15 47 4.77	11.745	17 13 28.2	40.83	20 57.5
4	15 51 47.35	11.804	17 29 37.8	39.97	20 58.3
5	15 56 31.34	11.862	17 45 26.3	39.08	20 59.1
6	16 1 16.72	+11.919	−18 0 53.0	−38.15	21 0.0
7	16 6 3.46	11.976	18 15 57.0	37.19	21 0.8
8	16 10 51.56	12.032	18 30 37.6	36.19	21 1.7
9	16 15 41.00	12.087	18 44 53.9	35.16	21 2.6
10	16 20 31.73	12.141	18 58 45.2	34.10	21 3.5
11	16 25 23.74	+12.194	−19 12 10.6	−33.01	21 4.4
12	16 30 17.00	12.245	19 25 9.5	31.89	21 5.4
13	16 35 11.48	12.295	19 37 41.2	30.74	21 6.4
14	16 40 7.15	12.344	19 49 44.9	29.56	21 7.4
15	16 45 3.97	12.391	20 1 19.9	28.35	21 8.4
16	16 50 1.91	+12.437	−20 12 25.5	−27.11	21 9.5
17	16 55 0.95	12.482	20 23 1.1	25.85	21 10.5
18	17 0 1.03	12.525	20 33 6.0	24.56	21 11.6
19	17 5 2.14	12.567	20 42 39.7	23.25	21 12.7
20	17 10 4.24	12.607	20 51 41.6	21.91	21 13.8
21	17 15 7.28	+12.646	−21 0 11.1	−20.55	21 14.9
22	17 20 11.23	12.683	21 8 7.7	19.17	21 16.1
23	17 25 16.05	12.718	21 15 30.9	17.76	21 17.2
24	17 30 21.70	12.752	21 22 20.2	16.34	21 18.4
25	17 35 28.13	12.784	21 28 35.1	14.90	21 19.6
26	17 40 35.30	+12.814	−21 34 15.3	−13.44	21 20.8
27	17 45 43.18	12.842	21 39 20.2	11.97	21 22.0
28	17 50 51.71	12.868	21 43 49.6	10.48	21 23.2
29	17 56 0.85	12.892	21 47 42.9	8.97	21 24.4
30	18 1 10.54	12.915	21 51 0.0	7.45	21 25.6
31	18 6 20.74	+12.935	−21 53 40.5	− 5.92	21 26.8
32	18 11 31.41	+12.953	−21 55 44.1	− 4.38	21 28.1

FEBRUARY.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m
1	18 11 31.41	+12.953	−21 55 44.1	− 4.38	21 28.1
2	18 16 42.47	12.969	21 57 10.7	2.83	21 29.3
3	18 21 53.89	12.982	21 57 59.9	− 1.27	21 30.6
4	18 27 5.61	12.993	21 58 11.6	+ 0.30	21 31.8
5	18 32 17.57	13.002	21 57 45.7	1.87	21 33.1
6	18 37 29.70	+13.008	−21 56 41.8	+ 3.45	21 34.3
7	18 42 41.95	13.012	21 55 0.1	5.03	21 35.6
8	18 47 54.26	13.014	21 52 40.5	6.61	21 36.9
9	18 53 6.59	13.013	21 49 43.0	8.19	21 38.2
10	18 58 18.86	13.010	21 46 7.4	9.77	21 39.5
11	19 3 31.03	+13.004	−21 41 53.9	+11.35	21 40.7
12	19 8 43.03	12.996	21 37 2.5	12.93	21 41.9
13	19 13 54.82	12.986	21 31 33.3	14.50	21 43.2
14	19 19 6.34	12.973	21 25 26.5	16.07	21 44.5
15	19 24 17.52	12.959	21 18 42.2	17.63	21 45.7
16	19 29 28.35	+12.942	−21 11 20.5	+19.18	21 46.9
17	19 34 38.76	12.924	21 3 21.8	20.72	21 48.1
18	19 39 48.70	12.904	20 54 46.1	22.25	21 49.3
19	19 44 58.14	12.882	20 45 33.8	23.77	21 50.5
20	19 50 7.03	12.858	20 35 45.2	25.28	21 51.7
21	19 55 15.34	+12.833	−20 25 20.6	+26.77	21 52.9
22	20 0 23.03	12.806	20 14 20.3	28.25	21 54.1
23	20 5 30.07	12.778	20 2 44.7	29.71	21 55.3
24	20 10 36.41	12.749	19 50 34.2	31.16	21 56.5
25	20 15 42.03	12.719	19 37 49.1	32.59	21 57.6
26	20 20 46.91	+12.688	−19 24 29.9	+34.00	21 58.7
27	20 25 51.03	12.655	19 10 37.0	35.40	21 59.8
28	20 30 54.34	12.621	18 56 10.8	36.78	22 0.9
29	20 35 56.83	12.586	18 41 11.9	38.14	22 2.0
30	20 40 58.49	12.551	18 25 40.7	39.47	22 3.1
31	20 45 59.29	+12.515	−18 9 37.8	+40.78	22 4.1
32	20 50 59.22	+12.478	−17 53 3.6	+42.07	22 5.2

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.
Semidiameter . .	9″.4	9″.1	8″.7	8″.4	8″.2	7″.9	7″.7
Hor. Parallax . .	9.8	9.4	9.0	8.7	8.4	8.2	7.9

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.
Semidiameter . .	7″.4	7″.2	7″.0	6″.9	6″.7	6″.6
Hor. Parallax . .	7.7	7.5	7.3	7.1	6.9	6.8

NOTE.—The sign + indicates north declinations: the sign — indicates south declinations.

GREENWICH MEAN TIME.

MARCH.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon	Noon.	
	h m s	s	° ′ ″	″	h m
1	20 40 58.49	+12.551	−18 25 40.7	+39.47	22 3.1
2	20 45 59.29	12.515	18 9 37.8	40.78	22 4.1
3	20 50 59.22	12.478	17 53 3.6	42.07	22 5.2
4	20 55 58.26	12.441	17 35 58.8	43.34	22 6.2
5	21 0 56.38	12.403	17 18 23.8	44.58	22 7.2
6	21 5 53.58	+12.364	−17 0 19.2	+45.80	22 8.2
7	21 10 49.85	12.325	16 41 45.7	46.99	22 9.2
8	21 15 45.18	12.286	16 22 43.8	48.16	22 10.2
9	21 20 39.56	12.246	16 3 14.2	49.30	22 11.2
10	21 25 32.98	12.206	15 43 17.4	50.42	22 12.1
11	21 30 25.44	+12.166	−15 22 54.2	+51.51	22 13.0
12	21 35 16.94	12.126	15 2 5.2	52.57	22 13.9
13	21 40 7.47	12.086	14 40 50.9	53.61	22 14.8
14	21 44 57.04	12.046	14 19 12.1	54.62	22 15.6
15	21 49 45.66	12.006	13 57 9.4	55.60	22 16.5
16	21 54 33.33	+11.967	−13 34 43.4	+56.56	22 17.3
17	21 59 20.07	11.928	13 11 54.9	57.48	22 18.1
18	22 4 5.88	11.889	12 48 44.6	58.38	22 18.9
19	22 8 50.78	11.851	12 25 13.1	59.25	22 19.7
20	22 13 34.78	11.814	12 1 21.1	60.09	22 20.5
21	22 18 17.90	+11.778	−11 37 9.3	+60.90	22 21.3
22	22 23 0.17	11.743	11 12 38.3	61.68	22 22.0
23	22 27 41.60	11.709	10 47 48.8	62.43	22 22.8
24	22 32 22.23	11.676	10 22 41.5	63.16	22 23.5
25	22 37 2.06	11.644	9 57 17.1	63.86	22 24.2
26	22 41 41.13	+11.613	− 9 31 36.2	+64.53	22 24.9
27	22 46 19.46	11.583	9 5 39.6	65.17	22 25.6
28	22 50 57.09	11.554	8 39 27.9	65.79	22 26.3
29	22 55 34.04	11.526	8 13 1.7	66.38	22 27.0
30	23 0 10.35	11.500	7 46 21.7	66.94	22 27.6
31	23 4 46.04	+11.475	− 7 19 28.7	+67.47	22 28.2
32	23 9 21.15	+11.451	− 6 52 23.4	+67.97	22 28.8

APRIL.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	23 9 21.15	+11.451	−6 52 23.4	+67.97	22 28.8
2	23 13 55.70	11.428	6 25 6.4	68.44	22 29.4
3	23 18 29.73	11.407	5 57 38.4	68.89	22 30.1
4	23 23 3.27	11.387	5 30 0.1	69.30	22 30.7
5	23 27 36.35	11.369	5 2 12.1	69.69	22 31.3
6	23 32 9.01	+11.352	−4 34 15.1	+70.05	22 31.9
7	23 36 41.27	11.336	4 6 10.0	70.38	22 32.5
8	23 41 13.16	11.322	3 37 57.3	70.68	22 33.1
9	23 45 44.73	11.309	3 9 37.8	70.95	22 33.7
10	23 50 16.00	11.297	2 41 12.2	71.19	22 34.3
11	23 54 47.01	+11.287	−2 12 41.1	+71.40	22 34.8
12	23 59 17.80	11.278	1 44 5.3	71.58	22 35.4
13	0 3 48.39	11.271	1 15 25.5	71.74	22 35.9
14	0 8 18.83	11.265	0 46 42.3	71.86	22 36.5
15	0 12 49.15	11.261	−0 17 56.4	71.96	22 37.1
16	0 17 19.38	+11.259	+0 10 51.4	+72.02	22 37.7
17	0 21 49.57	11.258	0 39 40.5	72.06	22 38.2
18	0 26 19.75	11.259	1 8 30.1	72.07	22 38.8
19	0 30 49.97	11.261	1 37 19.6	72.05	22 39.3
20	0 35 20.27	11.265	2 6 8.4	72.00	22 39.9
21	0 39 50.68	+11.270	+2 34 55.7	+71.93	22 40.4
22	0 44 21.24	11.277	3 3 40.8	71.82	22 41.0
23	0 48 52.00	11.286	3 32 23.1	71.69	22 41.6
24	0 53 22.99	11.297	4 1 1.9	71.53	22 42.2
25	0 57 54.26	11.309	4 29 36.5	71.34	22 42.7
26	1 2 25.85	+11.323	+4 58 6.3	+71.12	22 43.3
27	1 6 57.79	11.339	5 26 30.5	70.88	22 43.9
28	1 11 30.13	11.357	5 54 48.5	70.61	22 44.5
29	1 16 2.91	11.376	6 22 59.5	70.31	22 45.1
30	1 20 36.16	11.397	6 51 3.0	69.98	22 45.7
31	1 25 9.92	+11.418	+7 18 58.2	+69.62	22 46.4
32	1 29 44.23	+11.441	+7 46 44.4	+69.23	22 47.0

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.
Semidiameter . .	6″.6	6″.4	6″.3	6″.2	6″.0	5″.9	5″.8
Hor. Parallax . .	6 8	6.6	6.5	6.4	6.3	6.1	6.0

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.
Semidiameter. . .	5″.7	5″.7	5″.6	5″.5	5″.4	5″.4
Hor. Parallax . . .	5.9	5.9	5.8	5.7	5.6	5.5

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

MAY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	1 25 9.92	+11.418	+ 7 18 58.2	+69.62	22 46.4
2	1 29 44.23	11.441	7 46 44.4	69.23	22 47.0
3	1 34 19.11	11.466	8 14 20.8	68.81	22 47.7
4	1 38 54.61	11.492	8 41 46.9	68.36	22 48.3
5	1 43 30.77	11.520	9 9 1.8	67.88	22 49.0
6	1 48 7.60	+11.549	+ 9 36 4.9	+67.38	22 49.7
7	1 52 45.15	11.580	10 2 55.5	66.84	22 50.4
8	1 57 23.44	11.611	10 29 32.8	66.27	22 51.1
9	2 2 2.50	11.644	10 55 56.1	65.67	22 51.8
10	2 6 42.37	11.678	11 22 4.6	65.04	22 52.5
11	2 11 23.06	+11.713	+11 47 57.7	+64.38	22 53.3
12	2 16 4.61	11.749	12 13 34.6	63 69	22 54.0
13	2 20 47.04	11.787	12 38 54.6	62.97	22 54.8
14	2 25 30.37	11.825	13 3 56.9	62.22	22 55.6
15	2 30 14.63	11.865	13 28 40 8	61.44	22 56.4
16	2 34 59.84	+11.905	+13 53 5.6	+60.62	22 57.2
17	2 39 46.02	11.946	14 17 10.6	59.78	22 58.1
18	2 44 33.21	11.988	14 40 55.0	58.91	22 58.9
19	2 49 21.41	12.030	15 4 18.2	58.01	22 59.8
20	2 54 10.65	12.073	15 27 19.3	57.08	23 0.7
21	2 59 0.93	+12.117	+15 49 57.7	+56.12	23 1.6
22	3 3 52.28	12.162	16 12 12.7	55.13	23 2.5
23	3 8 44.71	12.207	16 34 3.5	54.11	23 3.5
24	3 13 38.23	12.253	16 55 29.5	53.06	23 4.5
25	3 18 32.85	12.299	17 16 29.9	51.98	23 5.5
26	3 23 28.60	+12.346	+17 37 4.1	+50.87	23 6.5
27	3 28 25.47	12.393	17 57 11.4	49.73	23 7.5
28	3 33 23.47	12.440	18 16 51.1	48.56	23 8.5
29	3 38 22.60	12.487	18 36 2.4	47.37	23 9.6
30	3 43 22.86	12.534	18 54 44.8	46.15	23 10.7
31	3 48 24.25	+12.581	+19 12 57.5	+44.90	23 11.8
32	3 53 26.77	+12.628	+19 30 39.9	+43.63	23 12.9

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.
Semidiameter . .	″ 5.3	″ 5.2	″ 5.2	″ 5.1	″ 5.1	″ 5.1
Hor. Parallax . .	5.5	5.4	5.4	5.3	5.3	5.2

JUNE.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	3 53 26.77	+12.628	+19 30 39.9	+43.63	23 12.9
2	3 58 30.40	12.674	19 47 51.3	42.33	23 14.1
3	4 3 35.13	12.720	20 4 31.0	41.00	23 15.2
4	4 8 40.96	12.765	20 20 38.5	39.64	23 16.4
5	4 13 47.86	12.810	20 36 13.0	38.25	23 17.6
6	4 18 55.81	+12.853	+20 51 13.9	+36.84	23 18.8
7	4 24 4.80	12.896	21 5 40.7	35.41	23 20.0
8	4 29 14.79	12.938	21 19 32.7	33.95	23 21.2
9	4 34 25.77	12.978	21 32 49.4	32.47	23 22.4
10	4 39 37.70	13.017	21 45 30.2	30.96	23 23.7
11	4 44 50.56	+13.055	+21 57 34.6	+29.43	23 25.0
12	4 50 4.31	13.091	22 9 2.0	27.87	23 26.3
13	4 55 18.90	13.125	22 19 51.9	26.29	23 27.6
14	5 0 34.30	13.158	22 30 3.9	24.70	23 29.0
15	5 5 50.48	13.189	22 39 37.4	23.09	23 30.3
16	5 11 7.39	+13.219	+22 48 32.0	+21.46	23 31.7
17	5 16 24.98	13.247	22 56 47.4	19.82	23 33.0
18	5 21 43.22	13.273	23 4 23.2	18.16	23 34.4
19	5 27 2.06	13.297	23 11 19.0	16.49	23 35.8
20	5 32 21.45	13.319	23 17 34.4	14.80	23 37.2
21	5 37 41.35	+13.339	+23 23 9.1	+13.09	23 38.6
22	5 43 1.70	13.357	23 28 2.9	11.38	23 40.0
23	5 48 22.45	13.373	23 32 15.5	9.66	23 41.4
24	5 53 43.55	13.386	23 35 46.6	7.93	23 42.8
25	5 59 4.95	13.397	23 38 36.1	6.19	23 44.2
26	6 4 26.60	+13.406	+23 40 43.9	+ 4.45	23 45.6
27	6 9 48.44	13.413	23 42 9.8	2.70	23 47.0
28	6 15 10.41	13.417	23 42 53.7	+ 0.95	23 48.5
29	6 20 32.46	13.419	23 42 55.5	− 0.80	23 49.9
30	6 25 54.53	13.419	23 42 15.2	2.56	23 51.3
31	6 31 16.57	+13.417	+23 40 52.6	− 4.31	23 52.7
32	6 36 38.52	+13.412	+23 38 47.9	− 6.07	23 54.2

Day of the Month.	4th.	9th.	14th.	19th.	24th.	29th.
Semidiameter . .	″ 5.0	″ 5.0	″ 5.0	″ 5.0	″ 4.9	″ 4.9
Hor. Parallax . .	5.2	5.2	5.2	5.1	5.1	5.1

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

JULY.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m
1	6 31 16.57	+13.417	+23 40 52.6	− 4.31	23 52.7
2	6 36 38.52	13.412	23 38 47.9	6.07	23 54.2
3	6 42 0.31	13.405	23 36 1.1	7.83	23 55.6
4	6 47 21.90	13.395	23 32 32.2	9.58	23 57.0
5	6 52 43.22	13.383	23 28 21.3	11.33	23 58.4
6	6 58 4.23	+13.368	+23 23 28.7	−13.07	23 59.9
7	7 3 24.84	13.351	23 17 54.4	14.80	
8	7 8 45.02	13.332	23 11 38.7	16.52	0 1.3
9	7 14 4.71	13.310	23 4 41.8	18 23	0 2.7
10	7 19 23.85	13.286	22 57 3.9	19 93	0 4.1
11	7 24 42.40	+13.259	+22 48 45.3	−21.62	0 5.4
12	7 30 0.30	13.231	22 39 46.3	23.29	0 6.8
13	7 35 17.50	13.201	22 30 7.3	24.95	0 8.1
14	7 40 33.96	13.170	22 19 48.7	26.60	0 9.4
15	7 45 49.63	13.137	22 8 50.7	28.23	0 10.7
16	7 51 4.49	+13 101	+21 57 13.9	−29.84	0 12.0
17	7 56 18.48	13.064	21 44 58.6	31.44	0 13.2
18	8 1 31.56	13.026	21 32 5.3	33.01	0 14.5
19	8 6 43.71	12.986	21 18 34.5	34.56	0 15.7
20	8 11 54.90	12.945	21 4 26.7	36.09	0 17.0
21	8 17 5.10	+12.903	+20 49 42.4	−37.60	0 18.2
22	8 22 14.29	12.860	20 34 22.2	39.08	0 19.5
23	8 27 22.44	12.817	20 18 26.6	40.54	0 20.7
24	8 32 29.52	12.773	20 1 56.2	41.98	0 21.9
25	8 37 35 52	12 728	19 44 51.5	43.40	0 23.2
26	8 42 40.44	+12.682	+19 27 13.1	−44.79	0 24.3
27	8 47 44.25	12.636	19 9 1.7	46.15	0 25.4
28	8 52 46.96	12.589	18 50 17.9	47.49	0 26.5
29	8 57 48.55	12.542	18 31 2.2	48.80	0 27.6
30	9 2 49.01	12.495	18 11 15 4	50.09	0 28.7
31	9 7 48.33	+12.448	+17 50 58.1	−51.35	0 29.7
32	9 12 46.52	+12.401	+17 30 10.9	−52.58	0 30.8

Day of the Month.	4th.	9th.	14th.	19th.	24th.	29th.
Semidiameter . .	″ 4.9	″ 4.9	″ 4.9	″ 4.9	″ 5.0	″ 5.0
Hor. Parallax . .	5.1	5.1	5.1	5.1	5.1	5.1

AUGUST.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m
1	9 12 46.52	+12.401	+17 30 10.9	−52.58	0 30.8
2	9 17 43.58	12.354	17 8 54.5	53.78	0 31.8
3	9 22 39.51	12.307	16 47 9.7	54.95	0 32.8
4	9 27 34.31	12.260	16 24 57.2	56.09	0 33.8
5	9 32 27.99	12.213	16 2 17.6	57.21	0 34.8
6	9 37 20.55	+12.167	+15 39 11.5	−58.29	0 35.7
7	9 42 11.99	12 121	15 15 39.8	59.35	0 36.6
8	9 47 2.33	12.075	14 51 43.1	60.37	0 37.5
9	9 51 51.59	12.030	14 27 22.2	61.37	0 38.4
10	9 56 39.78	11.985	14 2 37.9	62.33	0 39.2
11	10 1 26.90	+11.941	+13 37 30.8	−63.26	0 40.0
12	10 6 12.98	11.898	13 12 1.7	64.16	0 40.8
13	10 10 58.04	11.856	12 46 11.3	65.03	0 41.6
14	10 15 42.10	11.815	12 20 0.3	65.87	0 42.4
15	10 20 25.18	11.775	11 53 29.5	66.68	0 43.2
16	10 25 7.31	+11.736	+11 26 39.6	−67.46	0 43.9
17	10 29 48.52	11.698	10 59 31.4	68.21	0 44.7
18	10 34 28.84	11.661	10 32 5.6	68 93	0 45.4
19	10 39 8.29	11.626	10 4 22.9	69.62	0 46.1
20	10 43 46.91	11.592	9 36 24.1	70.28	0 46.8
21	10 48 24.73	+11.560	+ 9 8 9.8	−70.91	0 47.5
22	10 53 1.78	11.529	8 39 40.8	71.51	0 48.3
23	10 57 38.11	11.499	8 10 57.8	72.08	0 49.0
24	11 2 13.74	11.471	7 42 1.6	72.62	0 49.7
25	11 6 48.72	11.444	7 12 52.9	73.12	0 50.3
26	11 11 23.08	+11.419	+ 6 43 32.3	−73.60	0 50.9
27	11 15 56.87	11.396	6 14 0.7	74.04	0 51.5
28	11 20 30.12	11.375	5 44 18.6	74.46	0 52.1
29	11 25 2.88	11.355	5 14 26.8	74.84	0 52.7
30	11 29 35.17	11 337	4 44 26.1	75.20	0 53.3
31	11 34 7.04	+11.320	+ 4 14 17.2	−75.53	0 53.9
32	11 38 38.54	+11.305	+ 3 44 0.7	−75.83	0 54.4

Day of the Month.	3d.	8th.	13th.	18th.	23d.	28th.
Semidiameter . .	″ 5.0	″ 5.0	″ 5.0	″ 5.1	″ 5.1	″ 5.1
Hor. Parallax . .	5.2	5.2	5.2	5.2	5.3	5.3

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign − indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

SEPTEMBER.

Day of Month	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	11 38 38.54	+11.305	+ 3 44 0.7	−75.83	0 54.4
2	11 43 9.70	11.292	3 13 37.4	76.10	0 55.0
3	11 47 40.56	11.280	2 43 8.0	76.34	0 55.5
4	11 52 11.16	11.270	2 12 33.4	76.55	0 56.1
5	11 56 41.54	11.262	1 41 54.1	76.73	0 56.6
6	12 1 11.75	+11.255	+ 1 11 10.9	−76.87	0 57.2
7	12 5 41.82	11.250	0 40 24.6	76.99	0 57.8
8	12 10 11.78	11.247	+ 0 9 36.0	77.07	0 58.4
9	12 14 41.68	11.246	− 0 21 14.3	77.13	0 58.9
10	12 19 11.58	11.246	0 52 5.6	77.15	0 59.5
11	12 23 41.50	+11.248	− 1 22 57.1	−77.14	1 0.0
12	12 28 11.49	11.252	1 53 48.1	77.10	1 0.6
13	12 32 41.59	11.258	2 24 37.8	77.03	1 1.1
14	12 37 11.83	11.265	2 55 25.4	76.93	1 1.7
15	12 41 42.27	11.274	3 26 10.2	76.80	1 2.2
16	12 46 12.95	+11.284	− 3 56 51.6	−76.64	1 2.8
17	12 50 43.90	11.296	4 27 28.7	76.45	1 3.4
18	12 55 15.17	11.310	4 58 0.9	76.23	1 4.0
19	12 59 46.81	11.326	5 28 27.4	75.98	1 4.5
20	13 4 18.85	11.344	5 58 47.4	75.69	1 5.1
21	13 8 51.35	+11.364	− 6 29 0.3	−75.38	1 5.7
22	13 13 24.35	11.386	6 59 5.3	75.03	1 6.3
23	13 17 57.88	11.409	7 29 1.6	74.66	1 6.9
24	13 22 32.00	11.434	7 58 48.6	74.25	1 7.5
25	13 27 6.73	11.461	8 28 25.5	73.82	1 8.2
26	13 31 42.12	+11.489	− 8 57 51.5	−73.35	1 8.8
27	13 36 18.22	11.519	9 27 5.9	72.85	1 9.5
28	13 40 55.07	11.551	9 56 8.0	72.32	1 10.2
29	13 45 32.69	11.584	10 24 57.0	71.76	1 10.9
30	13 50 11.13	11.619	10 53 32.1	71.16	1 11.6
31	13 54 50.42	+11.655	−11 21 52.5	−70.54	1 12.3
32	13 59 30.60	+11.693	−11 49 57.6	−69.88	1 13.0

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.
Semidiameter . . .	″ 5.2	″ 5.2	″ 5.3	″ 5.3	″ 5.4	″ 5.5
Horizontal Parallax	5.4	5.4	5.5	5.5	5.6	5.6

OCTOBER.

Day of Month	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	13 54 50.42	+11.655	−11 21 52.5	−70.54	1 12.3
2	13 59 30.60	11.693	11 49 57.6	69.88	1 13.0
3	14 4 11.69	11.732	12 17 46.5	69.19	1 13.8
4	14 8 53.73	11.772	12 45 18.4	68.47	1 14.5
5	14 13 36.74	11.813	13 12 32.5	67.71	1 15.3
6	14 18 20.76	+11.855	−13 39 28.0	−66.92	1 16.1
7	14 23 5.81	11.899	14 6 4.2	66.10	1 16.9
8	14 27 51.92	11.943	14 32 20.2	65.25	1 17.7
9	14 32 39.10	11.988	14 58 15.3	64.35	1 18.6
10	14 37 27.38	12.034	15 23 48.6	63.43	1 19.4
11	14 42 16.77	+12.081	−15 48 59.4	−62.47	1 20.3
12	14 47 7.29	12.128	16 13 46.8	61.48	1 21.2
13	14 51 58.97	12.177	16 38 10.1	60.46	1 22.1
14	14 56 51.81	12.226	17 2 8.4	59.40	1 23.0
15	15 1 45.83	12.276	17 25 40.9	58.31	1 24.0
16	15 6 41.04	+12.326	−17 48 47.0	−57.19	1 25.0
17	15 11 37.45	12.376	18 11 25.7	56.04	1 26.0
18	15 16 35.08	12.427	18 33 36.4	54.85	1 27.0
19	15 21 33.93	12.478	18 55 18.2	53.63	1 28.1
20	15 26 33.99	12.529	19 16 30.5	52.38	1 29.1
21	15 31 35.26	+12 580	−19 37 12.5	−51.10	1 30.2
22	15 36 37.76	12.630	19 57 23.3	49.79	1 31.3
23	15 41 41.49	12.681	20 17 2.3	48.45	1 32.4
24	15 46 46.43	12.731	20 36 8.7	47.08	1 33.5
25	15 51 52.57	12.781	20 54 41.9	45.68	1 34.7
26	15 56 59.91	+12.831	−21 12 41.1	−44.25	1 35.9
27	16 2 8.43	12.880	21 30 5.6	42.79	1 37.1
28	16 7 18.11	12.928	21 46 54.8	41.30	1 38.3
29	16 12 28.94	12.975	22 3 8.0	39.78	1 39.6
30	16 17 40.89	13.021	22 18 44.5	38.24	1 40.8
31	16 22 53.94	+13.066	−22 33 43.6	−36.67	1 42.1
32	16 28 8.04	+13.109	−22 48 4.8	−35.08	1 43.4

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.
Semidiameter . .	″ 5.5	″ 5.6	″ 5.7	″ 5.8	″ 5.9	″ 6.0
Hor. Parallax . .	5.7	5.8	5.9	6.0	6.1	6.2

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

NOVEMBER.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m
1	16 28 8.04	+13.109	−22 48 4.8	−35.08	1 43.4
2	16 33 23.17	13.151	23 1 47.4	33.46	1 44.7
3	16 38 39.28	13.191	23 14 50.8	31.82	1 46.0
4	16 43 56.34	13.230	23 27 14.5	30.15	1 47.4
5	16 49 14.31	13.267	23 38 57.9	28.46	1 48.7
6	16 54 33.14	+13.302	−23 50 0.5	−26.75	1 50.1
7	16 59 52.77	13.334	24 0 21.7	25.02	1 51.4
8	17 5 13.14	13.364	24 10 1.2	23.27	1 52.9
9	17 10 34.20	13.391	24 18 58.5	21.50	1 54.3
10	17 15 55.89	13.416	24 27 13.0	19.71	1 55.7
11	17 21 18.15	+13.439	−24 34 44.4	−17.91	1 57.1
12	17 26 40.94	13.459	24 41 32.4	16.09	1 58.6
13	17 32 4.19	13.477	24 47 36.7	14.26	2 0.0
14	17 37 27.82	13.492	24 52 57.0	12.42	2 1.5
15	17 42 51.78	13.504	24 57 33.0	10.57	2 3.0
16	17 48 15.99	+13.513	−25 1 24.5	− 8.71	2 4.5
17	17 53 40.39	13.520	25 4 31.3	6.85	2 5.9
18	17 59 4.90	13.523	25 6 53.2	4.98	2 7.4
19	18 4 29.47	13.524	25 8 30.2	3.11	2 8.8
20	18 9 54.03	13.522	25 9 22.2	− 1.23	2 10.3
21	18 15 18.51	+13.517	−25 9 29.1	+ 0.65	2 11.7
22	18 20 42.84	13.509	25 8 51.0	2.53	2 13.2
23	18 26 6 96	13.499	25 7 27.8	4.41	2 14.6
24	18 31 30.79	13.486	25 5 19.5	6.28	2 16.1
25	18 36 54.27	13.470	25 2 26.2	8.15	2 17.5
26	18 42 17.34	+13.451	−24 58 48.2	+10.01	2 19.0
27	18 47 39.93	13.430	24 54 25.6	11.87	2 20.4
28	18 53 1.96	13.406	24 49 18.6	13.72	2 21.9
29	18 58 23.37	13.379	24 43 27.5	15.55	2 23.3
30	19 3 44.10	13.349	24 36 52.4	17.37	2 24.7
31	19 9 4.09	+13.317	−24 29 33.6	+19.18	2 26.1
32	19 14 23.27	+13.281	−24 21 31.6	+20.98	2 27.5

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.
Semidiameter . .	″ 6.1	″ 6.2	″ 6.3	″ 6.4	″ 6.6	″ 6.7
Hor. Parallax . .	6.3	6.4	6.6	6.7	6.8	7.0

DECEMBER.

Day of Month.	Apparent Right Ascension.	Var. of R. A for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m
1	19 9 4.09	+13.317	−24 29 33.6	+19.18	2 26.1
2	19 14 23.27	13.281	24 21 31.6	20.98	2 27.5
3	19 19 41.56	13.243	24 12 46.7	22.76	2 28.9
4	19 24 58.92	13.203	24 3 19.2	24.53	2 30.2
5	19 30 15.29	13.160	23 53 9.5	26.28	2 31.5
6	19 35 30.60	+13.115	−23 42 18.2	+28.01	2 32.8
7	19 40 44.80	13.068	23 30 45.7	29.71	2 34.1
8	19 45 57.84	13.019	23 18 32.6	31.39	2 35.4
9	19 51 9.66	12.967	23 5 39.4	33.05	2 36.7
10	19 56 20.22	12.913	22 52 6.5	34.69	2 37.9
11	20 1 29.48	+12.858	−22 37 54.7	+36.30	2 39.1
12	20 6 37.38	12.801	22 23 4.4	37.89	2 40.3
13	20 11 43.90	12.742	22 7 36.3	39.45	2 41.5
14	20 16 48.98	12.682	21 51 31.2	40.99	2 42.6
15	20 21 52.61	12.621	21 34 49.6	42.49	2 43.7
16	20 26 54.76	+12.558	−21 17 32.3	+43.97	2 44.8
17	20 31 55.40	12.495	20 59 39.9	45 41	2 45.9
18	20 36 54.51	12.430	20 41 13.0	46.83	2 46.9
19	20 41 52.07	12.366	20 22 12.5	48.21	2 47.9
20	20 46 48.06	12.300	20 2 39.0	49.57	2 48.9
21	20 51 42.48	+12.234	−19 42 33.3	+50.89	2 49.9
22	20 56 35.31	12.168	19 21 56.2	52.19	2 50.8
23	21 1 26.54	12.101	19 0 48.4	53.45	2 51.7
24	21 6 16.17	12.035	18 39 10.7	54.69	2 52.6
25	21 11 4.20	11.968	18 17 3.8	55.89	2 53.5
26	21 15 50.63	+11.901	−17 54 28.4	+57.06	2 54.3
27	21 20 35.45	11.834	17 31 25.3	58.20	2 55.1
28	21 25 18.66	11.767	17 7 55.3	59.30	2 55.9
29	21 30 0.27	11.701	16 43 59.2	60.37	2 56.6
30	21 34 40.29	11.634	16 19 37.9	61.41	2 57.3
31	21 39 18.72	+11.568	−15 54 52.1	+62.41	2 58.0
32	21 43 55.56	+11.502	−15 29 42.6	+63.38	2 58.7

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.
Semidiameter . .	″ 6.9	″ 7.1	″ 7.3	″ 7.5	″ 7.7	″ 7.9	″ 8.1
Hor. Parallax . .	7.1	7.3	7.5	7.7	7.9	8.2	8.4

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

JANUARY.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m
1	12 50 44.39	+4.236	−3 8 42.9	−25.12	18 6.7
2	12 52 25.71	4.206	3 18 42.9	24.87	18 4.5
3	12 54 6.30	4.176	3 28 36.8	24.62	18 2.2
4	12 55 46.15	4.144	3 38 24.5	24.36	17 59.9
5	12 57 25.23	4.112	3 48 6.0	24.09	17 57.6
6	12 59 3.53	+4.079	−3 57 41.1	−23.82	17 55.3
7	13 0 41.03	4.045	4 7 9.6	23.55	17 53.0
8	13 2 17.71	4.011	4 16 31.4	23.27	17 50.6
9	13 3 53.54	3.975	4 25 46.5	22.98	17 48.3
10	13 5 28.51	3.939	4 34 54.7	22.69	17 45.9
11	13 7 2.59	+3.902	−4 43 55.8	−22.40	17 43.5
12	13 8 35.75	3.862	4 52 49.7	22.09	17 41.1
13	13 10 7.97	3.823	5 1 36.3	21.79	17 38.7
14	13 11 39.24	3.782	5 10 15.5	21.48	17 36.3
15	13 13 9.53	3.741	5 18 47.2	21.16	17 33.8
16	13 14 38.82	+3.699	−5 27 11.2	−20.84	17 31.4
17	13 16 7.09	3.656	5 35 27.5	20.52	17 28.9
18	13 17 34.31	3.612	5 43 36.0	20.19	17 26.4
19	13 19 0.46	3.567	5 51 36.5	19 85	17 23.9
20	13 20 25.52	3.521	5 59 29.0	19.51	17 21.4
21	13 21 49.46	+3.474	−6 7 13.2	−19.17	17 18.8
22	13 23 12.27	3.426	6 14 49.2	18 83	17 16.2
23	13 24 33.91	3.377	6 22 16.9	18.48	17 13.6
24	13 25 54.37	3.327	6 29 36.1	18.12	17 11.0
25	13 27 13.61	3.276	6 36 46.8	17.76	17 8.4
26	13 28 31.61	+3.224	−6 43 48.8	−17.40	17 5.8
27	13 29 48.34	3.170	6 50 42.1	17.04	17 3.1
28	13 31 3.77	3.115	6 57 26.5	16.66	17 0.4
29	13 32 17.86	3.059	7 4 1.9	16.28	16 57.7
30	13 33 30.58	3 001	7 10 28.1	15.90	16 54.9
31	13 34 41.90	+2.942	−7 16 45.1	−15.51	16 52.1
32	13 35 51.78	+2.881	−7 22 52.8	−15.12	16 49.3

FEBRUARY.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m
1	13 35 51.78	+2.881	−7 22 52.8	−15.12	16 49.3
2	13 37 0.18	2.818	7 28 50.9	14.72	16 46.5
3	13 38 7.05	2.754	7 34 39.2	14.31	16 43.7
4	13 39 12.35	2.688	7 40 17.7	13.89	16 40.9
5	13 40 16.05	2.620	7 45 46.2	13.48	16 38.0
6	13 41 18.11	+2.550	−7 51 4.6	−13.05	16 35.0
7	13 42 18.47	2.479	7 56 12.7	12.61	16 32.1
8	13 43 17.10	2.406	8 1 10.4	12.18	16 29.1
9	13 44 13.96	2.331	8 5 57.5	11.74	16 26.1
10	13 45 8.99	2.254	8 10 33.8	11.29	16 23.1
11	13 46 2.15	+2.175	−8 14 59.3	−10.83	16 20.0
12	13 46 53.40	2.095	8 19 13.7	10.37	16 16.9
13	13 47 42.72	2.013	8 23 17.0	9.91	16 13.7
14	13 48 30.04	1.930	8 27 9.1	9.43	16 10.5
15	13 49 15.34	1.844	8 30 49.7	8.95	16 7.3
16	13 49 58.56	+1.757	−8 34 18.9	−8.47	16 4.1
17	13 50 39.67	1.668	8 37 36.4	7.98	16 0.8
18	13 51 18.63	1.577	8 40 42.1	7.49	15 57.5
19	13 51 55.39	1.485	8 43 36.0	7.00	15 54.1
20	13 52 29.92	1.391	8 46 18.0	6.50	15 50.7
21	13 53 2.18	+1.296	−8 48 47.8	−5.99	15 47.3
22	13 53 32.12	1.198	8 51 5.4	5.48	15 43.9
23	13 53 59.70	1.099	8 53 10.8	4.97	15 40.4
24	13 54 24.89	0.999	8 55 3.8	4.45	15 36.9
25	13 54 47.64	0.896	8 56 44.3	3.92	15 33.3
26	13 55 7.90	+0.792	−8 58 12.1	−3.39	15 29.7
27	13 55 25.63	0.687	8 59 27.1	2.86	15 26.0
28	13 55 40.78	0.578	9 0 29.2	2.32	15 22.3
29	13 55 53.30	0.466	9 1 18.2	1.77	15 18.6
30	13 56 3.16	0.354	9 1 54.0	1.21	15 14.8
31	13 56 10.30	+0.240	−9 2 16.5	−0.66	15 10.9
32	13 56 14.68	+0.124	−9 2 25.5	−0.09	15 7.0

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.
Semidiameter . .	3.″7	3.″8	3.″9	4.″1	4.″3	4.″5	4.″7
Hor. Parallax . .	6.4	6.6	6.9	7.2	7.5	7.8	8.2

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.
Semidiameter . .	4.″9	5.″1	5.″4	5.″6	5.″9	6.″2
Hor. Parallax . .	8.6	9.0	9.4	9.9	10.4	10.9

NOTE.—The sign + indicates north declinations· the sign — indicates south declinations.

GREENWICH MEAN TIME.

MARCH.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m
1	13 56 3.16	+0.354	−9 1 54.0	− 1.21	15 14.8
2	13 56 10.30	0.240	9 2 16.5	0.66	15 10.9
3	13 56 14.68	0.124	9 2 25.5	− 0.09	15 7.0
4	13 56 16.26	+0.007	9 2 21.0	+ 0.48	15 3.1
5	13 56 15.02	−0.112	9 2 2.7	1.05	14 59.1
6	13 56 10.89	−0.232	−9 1 30.6	+ 1.63	14 55.1
7	13 56 3.86	0.354	9 0 44.7	2.21	14 51.0
8	13 55 53.90	0.477	8 59 44.8	2.79	14 46.9
9	13 55 40.98	0.601	8 58 30.9	3.37	14 42.7
10	13 55 25.07	0.726	8 57 2.8	3.96	14 38.5
11	13 55 6.16	−0 851	−8 55 20.6	+ 4.55	14 34.2
12	13 54 44.24	0.976	8 53 24.4	5.14	14 29.9
13	13 54 19.32	1.101	8 51 14.1	5.72	14 25.5
14	13 53 51.38	1.226	8 48 49.7	6.30	14 21.1
15	13 53 20.44	1.351	8 46 11.5	6.88	14 16.6
16	13 52 46.51	−1.476	−8 43 19.5	+ 7.45	14 12.1
17	13 52 9.61	1.599	8 40 13.8	8.02	14 7.5
18	13 51 29.77	1.721	8 36 54.6	8.57	14 2.9
19	13 50 47.01	1.841	8 33 22.1	9.12	13 58.2
20	13 50 1.38	1.960	8 29 36.5	9.67	13 53.5
21	13 49 12.91	−2.078	−8 25 38.1	+10.20	13 48.8
22	13 48 21.64	2.194	8 21 27.1	10.72	13 44.0
23	13 47 27.62	2.307	8 17 3.8	11.23	13 39.1
24	13 46 30.89	2.418	8 12 28.4	11.72	13 34.2
25	13 45 31.54	2 526	8 7 41.5	12.19	13 29.3
26	13 44 29.64	−2.631	−8 2 43.3	+12.65	13 24.3
27	13 43 25.26	2.732	7 57 34.2	13.10	13 19.3
28	13 42 18.48	2.831	7 52 14.6	13.53	13 14.2
29	13 41 9.37	2.926	7 46 45.0	13.94	13 9.1
30	13 39 58.01	3.018	7 41 5.7	14.32	13 4.0
31	13 38 44.53	−3.104	−7 35 17.6	+14.68	12 58.8
32	13 37 29.04	−3.185	−7 29 21.0	+15.02	12 53.6

APRIL.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m
1	13 37 29.04	−3.185	−7 29 21.0	+15.02	12 53.6
2	13 36 11.64	3.262	7 23 16.6	15.33	12 48.4
3	13 34 52.46	3.333	7 17 4.9	15.62	12 43.1
4	13 33 31.64	3.400	7 10 46.7	15.88	12 37.8
5	13 32 9.27	3.460	7 4 22.6	16.11	12 32.5
6	13 30 45.55	−3.514	−6 57 53.5	+16.30	12 27.2
7	13 29 20.62	3.561	6 51 20.3	16.45	12 21.9
8	13 27 54.65	3.601	6 44 43.7	16.58	12 16.5
9	13 26 27.80	3.634	6 38 4.6	16.66	12 11.1
10	13 25 0.24	3.660	6 31 23.9	16.71	12 5.7
11	13 23 32.13	−3.679	−6 24 42.6	+16.72	12 0.3
12	13 22 3.67	3.690	6 18 1.6	16.68	11 54.9
13	13 20 35.04	3.693	6 11 21.8	16.61	11 49.5
14	13 19 6.41	3.689	6 4 44.3	16.50	11 44.1
15	13 17 37.96	3.678	5 58 10.0	16.34	11 38.7
16	13 16 9.87	−3.659	−5 51 39.9	+16.15	11 33.3
17	13 14 42.32	3.634	5 45 14.9	15.92	11 27.9
18	13 13 15.47	3.601	5 38 55.8	15.65	11 22.6
19	13 11 49.48	3.562	5 32 43.7	15.35	11 17.2
20	13 10 24.51	3.515	5 26 39.3	15.00	11 11.9
21	13 9 0.72	−3.463	−5 20 43.6	+14.63	11 6.6
22	13 7 38.27	3.405	5 14 57.2	14.22	11 1.3
23	13 6 17.27	3.342	5 9 20.8	13.79	10 56.0
24	13 4 57.86	3.273	5 3 55.2	13.32	10 50.8
25	13 3 40.18	3.198	4 58 41.3	12.83	10 45.6
26	13 2 24.34	−3.119	−4 53 39.4	+12.31	10 40.4
27	13 1 10.48	3.034	4 48 50.3	11.77	10 35.3
28	12 59 58.69	2.946	4 44 14.5	11.20	10 30.2
29	12 58 49.07	2.854	4 39 52.6	10.62	10 25.1
30	12 57 41.72	2.757	4 35 44.9	10.01	10 20.1
31	12 56 36.73	−2.657	−4 31 52.0	+ 9.39	10 15.1
32	12 55 34.19	−2.553	−4 28 14.2	+ 8.75	10 10.2

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.
Semidiameter . .	″ 6.2	″ 6.5	″ 6.8	″ 7.2	″ 7.5	″ 7.8	″ 8.0
Hor. Parallax . .	10 9	11.4	12.0	12.5	13.0	13.4	13.9

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.
Semidiameter. . .	″ 8.1	″ 8.3	″ 8.3	″ 8.3	″ 8.2	″ 8.1
Hor. Parallax . . .	14.2	14.5	14.6	14.6	14.4	14.2

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign − indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

MAY.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	12 56 36.73	−2.657	−4 31 52.0	+ 9.39	10 15.1
2	12 55 34.19	2.553	4 28 14.2	8.75	10 10.2
3	12 54 34.20	2 445	4 24 52.2	8.09	10 5.3
4	12 53 36.83	2.335	4 21 46.1	7.41	10 0.4
5	12 52 42.14	2.222	4 18 56.4	6.73	9 55.6
6	12 51 50.20	−2.106	−4 16 23.3	+ 6.03	9 50.7
7	12 51 1.07	1.988	4 14 7.1	5.32	9 46.1
8	12 50 14.80	1.867	4 12 8.1	4 60	9 41.4
9	12 49 31.46	1.744	4 10 26.6	3.87	9 36.7
10	12 48 51.08	1.621	4 9 2.5	3.14	9 32.1
11	12 48 13.68	−1.496	−4 7 56.2	+ 2.39	9 27.6
12	12 47 39.29	1.370	4 7 7.6	1.64	9 23.1
13	12 47 7.93	1.242	4 6 36.9	0.91	9 18.7
14	12 46 39.62	1.116	4 6 23.9	+ 0.17	9 14.3
15	12 46 14.35	0 989	4 6 28.9	− 0.58	9 9.9
16	12 45 52 13	−0.862	−4 6 51.6	− 1.32	9 5.6
17	12 45 32.95	0.736	4 7 32.1	2.05	9 1.1
18	12 45 16.80	0.610	4 8 30.1	2.78	8 57.3
19	12 45 3.66	0.485	4 9 45.5	3.50	8 53.2
20	12 44 53.50	0.361	4 11 18.2	4.22	8 49.1
21	12 44 46.31	−0.238	−4 13 7.9	− 4.92	8 45.1
22	12 44 42.06	−0.117	4 15 14.5	5.62	8 41.1
23	12 44 40.72	+0.004	4 17 37.8	6.31	8 37.1
24	12 44 42.25	0.123	4 20 17.5	6.99	8 33.2
25	12 44 46.61	0.240	4 23 13.3	7.66	8 29.4
26	12 44 53.78	+0.356	−4 26 25.1	− 8.32	8 25.6
27	12 45 3.72	0.471	4 29 52.5	8.96	8 21.8
28	12 45 16.40	0.585	4 33 35.4	9.60	8 18.1
29	12 45 31.78	0.696	4 37 33.4	10.23	8 14.5
30	12 45 49.83	0.807	4 41 46.2	10.84	8 10.9
31	12 46 10.51	+0.916	−4 46 13.8	−11.45	8 7.3
32	12 46 33.78	+1.023	−4 50 55.7	−12.04	8 3.8

JUNE.

Day of Month.	Apparent Right Ascension.	Var. of R. A for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	12 46 33.78	+1.023	−4 50 55.7	−12.04	8 3.8
2	12 46 59.63	1.130	4 55 51.8	12.63	8 0.3
3	12 47 28.01	1.235	5 1 1.9	13.21	7 56.9
4	12 47 58.90	1.339	5 6 25.7	13.77	7 53.5
5	12 48 32.26	1.441	5 12 3.0	14.33	7 50.1
6	12 49 8.06	+1.542	−5 17 53.6	−14.88	7 46.8
7	12 49 46.27	1.642	5 23 57.3	15.42	7 43.5
8	12 50 26.85	1.740	5 30 13.7	15.94	7 40.2
9	12 51 9.77	1.836	5 36 42.6	16.46	7 37.0
10	12 51 54.99	1.931	5 43 23.7	16.96	7 33.8
11	12 52 42.46	+2.024	−5 50 16.9	−17.46	7 30.7
12	12 53 32.16	2.116	5 57 21.9	17.95	7 27.6
13	12 54 24.04	2.206	6 4 38.3	18.42	7 24.6
14	12 55 18.07	2.295	6 12 6.0	18.88	7 21.6
15	12 56 14.20	2.382	6 19 44.6	19.33	7 18.6
16	12 57 12.39	+2.467	−6 27 33.8	−19.76	7 15.6
17	12 58 12.60	2.550	6 35 33.3	20.19	7 12.7
18	12 59 14.80	2.632	6 43 42.9	20.61	7 9.8
19	13 0 18.94	2.712	6 52 2.4	21.01	7 6.9
20	13 1 24.99	2.791	7 0 31.3	21.40	7 4.1
21	13 2 32.91	+2.868	−7 9 9.5	−21.78	7 1.3
22	13 3 42.66	2.944	7 17 56.6	22.14	6 58.5
23	13 4 54.21	3.018	7 26 52.3	22.50	6 55.8
24	13 6 7.53	3.091	7 35 56.4	22.84	6 53.1
25	13 7 22.60	3.163	7 45 8.7	23.17	6 50.4
26	13 8 39.36	+3.234	−7 54 28.8	−23.50	6 47.7
27	13 9 57.82	3 305	8 3 56.6	23.81	6 45.1
28	13 11 17.93	3 372	8 13 31.9	24.12	6 42.5
29	13 12 39.68	3.440	8 23 14.4	24.41	6 40.0
30	13 14 3.05	3.507	8 33 3.8	24.70	6 37.4
31	13 15 28.01	+3.573	−8 43 0.0	−24.98	6 34.9
32	13 16 54.54	+3.638	−8 53 2.8	−25.25	6 32.4

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.
Semidiameter . .	″ 7.9	″ 7.7	″ 7.5	″ 7.2	″ 7.0	″ 6.7
Hor. Parallax . .	13.9	13 5	13.1	12.7	12.2	11.8

Day of the Month.	4th.	9th.	14th.	19th.	24th.	29th.
Semidiameter . .	″ 6.5	″ 6.2	″ 6.0	″ 5.8	″ 5.6	″ 5.4
Hor. Parallax . .	11.3	10.9	10.5	10.1	9.8	9.4

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

JULY.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m
1	13 15 28.01	+3.573	− 8 43 0.0	−24.98	6 34.9
2	13 16 54.54	3.638	8 53 2.8	25.25	6 32.4
3	13 18 22.62	3.702	9 3 11.9	25.51	6 29.9
4	13 19 52.24	3.766	9 13 27.2	25.76	6 27 5
5	13 21 23.38	3.829	9 23 48.4	26.01	6 25.1
6	13 22 56.01	+3.891	− 9 34 15.4	−26.24	6 22.7
7	13 24 30.13	3.952	9 44 48.0	26.47	6 20.3
8	13 26 5.72	4.013	9 55 25.9	26.69	6 18.0
9	13 27 42.75	4.073	10 6 9.0	26.90	6 15.7
10	13 29 21.21	4.132	10 16 57.0	27.10	6 13.4
11	13 31 1.08	+4.190	−10 27 49.7	−27.29	6 11.1
12	13 32 42.32	4.247	10 38 46.9	27.47	6 8.9
13	13 34 24.94	4.304	10 49 48.3	27.64	6 6.7
14	13 36 8.91	4.360	11 0 53.8	27.81	6 4.5
15	13 37 54.21	4.415	11 12 3.1	27.96	6 2.3
16	13 39 40.82	+4.469	−11 23 16.0	−28.11	6 0.1
17	13 41 28.72	4.522	11 34 32.2	28.24	5 58.0
18	13 43 17.89	4.575	11 45 51.6	28.36	5 55.9
19	13 45 8.32	4.627	11 57 13.8	28.48	5 53.8
20	13 46 59.99	4.678	12 8 38.6	28.58	5 51.7
21	13 48 52.87	+4.729	−12 20 5.8	−28.68	5 49.6
22	13 50 46.97	4.779	12 31 35.2	28.76	5 47.6
23	13 52 42.26	4.829	12 43 6.5	28.84	5 45.6
24	13 54 38.74	4.878	12 54 39.6	28.91	5 43.6
25	13 56 36.39	4.927	13 6 14.2	28.97	5 41.6
26	13 58 35.21	+4.975	−13 17 50.2	−29.02	5 39.6
27	14 0 35.19	5.023	13 29 27.3	29.06	5 37.7
28	14 2 36.32	5.071	13 41 5.3	29.10	5 35.8
29	14 4 38.61	5.119	13 52 44.1	29.12	5 33.9
30	14 6 42.02	5.166	14 4 23.3	29.14	5 32.0
31	14 8 46.57	+5.213	−14 16 2.9	−29.15	5 30.1
32	14 10.52.26	+5.260	−14 27 42.7	−29.16	5 28.3

AUGUST.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m
1	14 10 52.26	+5.260	−14 27 42.7	−29.16	5 28.3
2	14 12 59.08	5.307	14 39 22.5	29.15	5 26.5
3	14 15 7.03	5.354	14 51 2.1	29.14	5 24.7
4	14 17 16.09	5.401	15 2 41.4	29.12	5 22.9
5	14 19 26.27	5.447	15 14 20.1	29.10	5 21.1
6	14 21 37.56	+5.493	−15 25 58.0	−29.06	5 19.4
7	14 23 49.95	5.539	15 37 34.8	29.01	5 17.7
8	14 26 3.44	5.585	15 49 10.5	28.96	5 16.0
9	14 28 18.01	5.630	16 0 44.8	28.90	5 14.3
10	14 30 33.66	5.674	16 12 17.5	28.83	5 12.6
11	14 32 50.38	+5.719	−16 23 48.4	−28.74	5 10.9
12	14 35 8.17	5.763	16 35 17.2	28.65	5 9.3
13	14 37 27.01	5.807	16 46 43.8	28.55	5 7.7
14	14 39 46.91	5.850	16 58 7.9	28.45	5 6.1
15	14 42 7.83	5.893	17 9 29.2	28.33	5 4.5
16	14 44 29.79	+5.936	−17 20 47.5	−28.20	5 2.9
17	14 46 52.77	5.979	17 32 2.7	28.06	5 1.4
18	14 49 16.77	6.021	17 43 14.4	27.91	4 59.9
19	14 51 41.77	6.063	17 54 22.5	27 76	4 58.4
20	14 54 7.78	6.104	18 5 26.7	27.59	4 56.9
21	14 56 34.77	+6.145	−18 16 26.8	−27.41	4 55.4
22	14 59 2.76	6 187	18 27 22.6	27.23	4 53.9
23	15 1 31.73	6.228	18 38 13.8	27.04	4 52.4
24	15 4 1.69	6.269	18 49 0.3	26.84	4 50.9
25	15 6 32.63	6.310	18 59 41.9	26.63	4 49.5
26	15 9 4.55	+6.351	−19 10 18.3	−26.41	4 48.1
27	15 11 37.46	6.391	19 20 49.4	26.17	4 46.7
28	15 14 11.34	6.432	19 31 14.9	25.94	4 45.3
29	15 16 46.19	6.473	19 41 34.6	25.70	4 43.9
30	15 19 22.02	6.513	19 51 48.4	25.44	4 42.6
31	15 21 58.82	+6.554	−20 1 56.0	−25 18	4 41.3
32	15 24 36.59	+6.594	−20 11 57.2	−24.92	4 40.0

Day of the Month.	4th.	9th.	14th.	19th.	24th.	29th.
Semidiameter . .	″ 5.2	″ 5.0	″ 4.9	″ 4.7	″ 4.6	″ 4.5
Hor. Parallax . .	9.1	8.8	8.5	8.3	8.1	7.8

Day of the Month.	3d.	8th.	13th.	18th.	23d.	28th.
Semidiameter . .	″ 4.4	″ 4.2	″ 4.1	″ 4.0	″ 3.9	″ 3.9
Hor. Parallax . .	7.6	7.4	7.3	7.1	6.9	6.8

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign − indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

SEPTEMBER.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m
1	15 24 36.59	+6.594	−20 11 57.2	−24.92	4 40.0
2	15 27 15.33	6.634	20 21 51.9	24.64	4 38.7
3	15 29 55.03	6.674	20 31 39.8	24.35	4 37.4
4	15 32 35.68	6.713	20 41 20.8	24.06	4 36.1
5	15 35 17.29	6.753	20 50 54.5	23.75	4 34.9
6	15 37 59.86	+6.793	−21 0 20.9	−23.44	4 33.7
7	15 40 43.36	6.833	21 9 39.6	23.12	4 32.5
8	15 43 27.80	6.871	21 18 50.5	22.79	4 31.3
9	15 46 13.16	6.909	21 27 53.3	22.45	4 30.1
10	15 48 59.44	6.947	21 36 47.9	22.10	4 28.9
11	15 51 46.62	+6.984	−21 45 33.9	−21.74	4 27.8
12	15 54 34.69	7.021	21 54 11.2	21.37	4 26.7
13	15 57 23.65	7.058	22 2 39.6	20.99	4 25.6
14	16 0 13.48	7.094	22 10 58.7	20.60	4 24.5
15	16 3 4.17	7.130	22 19 8.5	20.21	4 23.4
16	16 5 55.73	+7.166	−22 27 8.6	−19.80	4 22.3
17	16 8 48.12	7.200	22 34 58.9	19.39	4 21.2
18	16 11 41.34	7.235	22 42 39.1	18.96	4 20.1
19	16 14 35.38	7.269	22 50 9.0	18.53	4 19.1
20	16 17 30.24	7.302	22 57 28.5	18.09	4 18.1
21	16 20 25.90	+7.336	−23 4 37.3	−17.64	4 17.1
22	16 23 22.36	7.369	23 11 35.3	17.19	4 16.1
23	16 26 19.61	7.402	23 18 22.2	16.72	4 15.1
24	16 29 17.64	7.434	23 24 57.8	16.24	4 14.1
25	16 32 16.44	7.466	23 31 22.0	15.76	4 13.1
26	16 35 16.01	+7.498	−23 37 34.6	−15.28	4 12.2
27	16 38 16.34	7.529	23 43 35.4	14.78	4 11.3
28	16 41 17.42	7.560	23 49 24.2	14.28	4 10.4
29	16 44 19.23	7.591	23 55 0.9	13.77	4 9.5
30	16 47 21.78	7.621	24 0 25.2	13.25	4 8.6
31	16 50 25.05	+7.651	−24 5 37.1	−12.73	4 7.7
32	16 53 29.03	+7.680	−24 10 36.3	−12.20	4 6.8

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.
Semidiameter . . .	″ 3.8	″ 3.7	″ 3.6	″ 3.6	″ 3.5	″ 3.4
Hor. Parallax . . .	6.6	6.5	6.4	6.2	6.1	6.0

OCTOBER.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m
1	16 50 25.05	+7.651	−24 5 37.1	−12.73	4 7.7
2	16 53 29.03	7.680	24 10 36.3	12.20	4 6.8
3	16 56 33.70	7.709	24 15 22.7	11.66	4 5.9
4	16 59 39.05	7.737	24 19 56.1	11.12	4 5.0
5	17 2 45.07	7.764	24 24 16.4	10.56	4 4.2
6	17 5 51.74	+7.791	−24 28 23.3	−10.01	4 3.4
7	17 8 59.04	7.817	24 32 16.7	9.44	4 2.6
8	17 12 6.97	7.843	24 35 56.4	8.87	4 1.8
9	17 15 15.49	7.867	24 39 22.3	8.29	4 1.0
10	17 18 24.59	7.891	24 42 34.3	7.70	4 0.2
11	17 21 34.26	+7.914	−24 45 32.1	− 7.12	3 59.4
12	17 24 44.47	7.936	24 48 15.7	6.52	3 58.6
13	17 27 55.20	7.958	24 50 45.0	5.91	3 57.8
14	17 31 6.44	7.978	24 52 59.7	5.31	3 57.1
15	17 34 18.16	7.998	24 54 59.7	4.69	3 56.4
16	17 37 30.34	+8.017	−24 56 45.0	− 4.07	3 55.7
17	17 40 42.97	8.035	24 58 15.3	3.45	3 54.9
18	17 43 56.04	8.053	24 59 30.6	2.82	3 54.2
19	17 47 9.51	8.070	25 0 30.8	2.19	3 53.5
20	17 50 23.38	8.086	25 1 15.8	1.56	3 52.8
21	17 53 37.63	+8.101	−25 1 45.4	− 0.92	3 52.1
22	17 56 52.24	8.116	25 1 59.7	− 0.27	3 51.4
23	18 0 7.19	8.130	25 1 58.5	+ 0.37	3 50.7
24	18 3 22.47	8.143	25 1 41.8	1.02	3 50.0
25	18 6 38.07	8.156	25 1 9.5	1.67	3 49.3
26	18 9 53.96	+8.168	−25 0 21.5	+ 2.33	3 48.6
27	18 13 10.13	8.179	24 59 17.7	2.99	3 47.9
28	18 16 26.57	8.190	24 57 58.2	3.65	3 47.2
29	18 19 43.26	8.200	24 56 22.8	4.31	3 46.5
30	18 23 0.17	8.209	24 54 31.6	4.97	3 45.9
31	18 26 17.30	+8.218	−24 52 24.4	+ 5.63	3 45.3
32	18 29 34.63	+8.226	−24 50 1.3	+ 6.30	3 44.7

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.
Semidiameter . .	″ 3.4	″ 3.3	″ 3.3	″ 3.2	″ 3.2	″ 3.1
Hor. Parallax . .	5.9	5.8	5.7	5.6	5.5	5.4

NOTE.—The sign + indicates north declinations: the sign — indicates south declinations.

GREENWICH MEAN TIME.

NOVEMBER.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m
1	18 29 34.63	+8.226	−24 50 1.3	+ 6.30	3 44.7
2	18 32 52.13	8.233	24 47 22.2	6.96	3 44.1
3	18 36 9.79	8.239	24 44 27.1	7.63	3 43.5
4	18 39 27.58	8.244	24 41 16.1	8.29	3 42.8
5	18 42 45.48	8.248	24 37 49.0	8.96	3 42.1
6	18 46 3.48	+8.252	−24 34 5.9	+ 9.63	3 41.5
7	18 49 21.56	8.254	24 30 6.7	10.30	3 40.9
8	18 52 39.69	8.256	24 25 51.6	10.96	3 40.3
9	18 55 57.85	8.257	24 21 20.5	11.63	3 39.6
10	18 59 16.02	8.257	24 16 33.4	12.29	3 38.9
11	19 2 34.17	+8.256	−24 11 30.4	+12.95	3 38.3
12	19 5 52.29	8.254	24 6 11.5	13.62	3 37.7
13	19 9 10.36	8.252	24 0 36.8	14.28	3 37.1
14	19 12 28.37	8.248	23 54 46.2	14.93	3 36.4
15	19 15 46.28	8.245	23 48 39.9	15.59	3 35.7
16	19 19 4.09	+8.239	−23 42 17.8	+16.24	3 35.1
17	19 22 21.77	8.234	23 35 40.2	16.89	3 34.5
18	19 25 39.32	8.228	23 28 47.0	17.54	3 33.8
19	19 28 56.71	8.221	23 21 38.3	18.18	3 33.1
20	19 32 13.94	8.214	23 14 14.2	18.82	3 32.4
21	19 35 31.00	+8.207	−23 6 34.9	+19.46	3 31.8
22	19 38 47.86	8.199	22 58 40.2	20.09	3 31.2
23	19 42 4.53	8.190	22 50 30.4	20.72	3 30.5
24	19 45 20.98	8.181	22 42 5.7	21.35	3 29.8
25	19 48 37.20	8.171	22 33 25.9	21.96	3 29.1
26	19 51 53.18	+8.161	−22 24 31.4	+22.58	3 28.5
27	19 55 8.92	8.151	22 15 22.2	23.19	3 27.8
28	19 58 24.41	8.140	22 5 58.4	23.80	3 27.1
29	20 1 39.63	8.128	21 56 20.0	24.40	3 26.4
30	20 4 54.57	8.117	21 46 27.3	24.99	3 25.7
31	20 8 9.22	+8.104	−21 36 20.4	+25.58	3 25.0
32	20 11 23.56	+8.091	−21 25 59.5	+26.16	3 24.3

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.
Semidiameter . .	″ 3.1	″ 3.0	″ 3.0	″ 2.9	″ 2.9	″ 2.8
Hor. Parallax . .	5.4	5.3	5.2	5.1	5.1	5.0

DECEMBER.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m
1	20 8 9.22	+8.104	−21 36 20.4	+25.58	3 25.0
2	20 11 23.56	8.091	21 25 59.5	26.16	3 24.3
3	20 14 37.59	8.078	21 15 24.6	26.74	3 23.6
4	20 17 51.30	8.064	21 4 36.0	27.31	3 22.9
5	20 21 4.67	8.050	20 53 33.7	27.88	3 22.1
6	20 24 17.69	+8.035	−20 42 17.9	+28.44	3 21.4
7	20 27 30.35	8.020	20 30 48.8	28.99	3 20.7
8	20 30 42.64	8.004	20 19 6.6	29.53	3 20.0
9	20 33 54.55	7.988	20 7 11.4	30.07	3 19.2
10	20 37 6.08	7.971	19 55 3.4	30.60	3 18.4
11	20 40 17.21	+7.955	−19 42 42.7	+31.12	3 17.7
12	20 43 27.94	7.938	19 30 9.5	31.64	3 17.0
13	20 46 38.25	7.921	19 17 24.1	32.14	3 16.2
14	20 49 48.14	7.903	19 4 26.6	32.64	3 15.4
15	20 52 57.61	7.885	18 51 17.2	33.13	3 14.6
16	20 56 6.64	+7.867	−18 37 56.1	+33.62	3 13.8
17	20 59 15.25	7.849	18 24 23.4	34.10	3 13.0
18	21 2 23.42	7.831	18 10 39.4	34.57	3 12.1
19	21 5 31.16	7.813	17 56 44.2	35.03	3 11.3
20	21 8 38.45	7.795	17 42 38.1	35.48	3 10.5
21	21 11 45.31	+7.777	−17 28 21.1	+35.93	3 9.6
22	21 14 51.74	7.759	17 13 53.6	36.37	3 8.7
23	21 17 57.73	7.741	16 59 15.6	36.80	3 7.9
24	21 21 3.29	7.723	16 44 27.4	37.22	3 7.1
25	21 24 8.41	7.704	16 29 29.2	37.63	3 6.3
26	21 27 13.10	+7.686	−16 14 21.1	+38.04	3 5.4
27	21 30 17.35	7.668	15 59 3.4	38.43	3 4.5
28	21 33 21.17	7.650	15 43 36.3	38.82	3 3.6
29	21 36 24.57	7.632	15 27 59.9	39.20	3 2.7
30	21 39 27.53	7.614	15 12 14.4	39.58	3 1.9
31	21 42 30.07	+7.597	−14 56 20.2	+39.94	3 1.0
32	21 45 32.18	+7.579	−14 40 17.3	+40.30	3 0.1

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.
Semidiameter . .	″ 2.8	″ 2.8	″ 2.7	″ 2.7	″ 2.7	″ 2.6	″ 2.6
Hor. Parallax . .	4.9	4.9	4.8	4.7	4.7	4.6	4.6

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign − indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

JANUARY.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m
1	15 42 12.73	+1.947	−18 47 12.0	−6.30	20 57.1
2	15 42 59.31	1.935	18 49 42.4	6.23	20 54.0
3	15 43 45.60	1.923	18 52 10.8	6.15	20 50.8
4	15 44 31.59	1.910	18 54 37.4	6.07	20 47.6
5	15 45 17.28	1.897	18 57 2.2	5.99	20 44.5
6	15 46 2.66	+1.884	−18 59 25.1	−5.91	20 41 3
7	15 46 47.72	1.871	19 1 46.1	5.83	20 38.1
8	15 47 32.46	1.857	19 4 5.2	5.75	20 34.9
9	15 48 16.86	1.843	19 6 22.3	5.67	20 31.7
10	15 49 0.91	1.829	19 8 37.5	5.59	20 28.5
11	15 49 44.61	+1.814	−19 10 50.8	−5.51	20 25.3
12	15 50 27.96	1.799	19 13 2.2	5.43	20 22.0
13	15 51 10.93	1.783	19 15 11.7	5.35	20 18.8
14	15 51 53.53	1.767	19 17 19.2	5.27	20 15.6
15	15 52 35.74	1.751	19 19 24.7	5.19	20 12.4
16	15 53 17.56	+1.734	−19 21 28.3	−5.11	20 9.1
17	15 53 58.98	1.717	19 23 30.0	5.03	20 5.9
18	15 54 39.99	1.700	19 25 29.7	4.95	20 2.6
19	15 55 20.59	1.683	19 27 27.3	4.86	19 59.3
20	15 56 0.77	1.665	19 29 23.0	4.78	19 56.0
21	15 56 40.51	+1.647	−19 31 16.7	−4.70	19 52.8
22	15 57 19.81	1.629	19 33 8.5	4.62	19 49.5
23	15 57 58.67	1.610	19 34 58.2	4.53	19 46.2
24	15 58 37.08	1.591	19 36 46.0	4.45	19 42.9
25	15 59 15.03	1.572	19 38 31.9	4 37	19 39.6
26	15 59 52.52	+1.552	−19 40 15.7	−4.29	19 36.3
27	16 0 29.53	1.532	19 41 57.6	4.21	19 32.9
28	16 1 6.07	1.512	19 43 37.5	4.13	19 29.6
29	16 1 42.11	1.492	19 45 15.4	4.04	19 26.2
30	16 2 17.67	1.471	19 46 51.4	3.96	19 22.9
31	16 2 52.72	+1.450	−19 48 25.4	−3.88	19 19.5
32	16 3 27.26	+1.428	−19 49 57.4	−3.79	19 16.2

FEBRUARY.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m
1	16 3 27.26	+1.428	−19 49 57.4	−3.79	19 16.2
2	16 4 1.29	1.406	19 51 27.5	3.71	19 12.8
3	16 4 34.78	1.384	19 52 55.5	3.63	19 9.4
4	16 5 7.74	1.362	19 54 21.6	3.55	19 6.0
5	16 5 40.16	1.339	19 55 45.8	3.47	19 2 6
6	16 6 12.03	+1.316	−19 57 8.0	−3.39	18 59.2
7	16 6 43.33	1.293	19 58 28.2	3.30	18 55.8
8	16 7 14.07	1.269	19 59 46.4	3.22	18 52.4
9	16 7 44.24	1.245	20 1 2.7	3.14	18 48.9
10	16 8 13.82	1.220	20 2 17.0	3.05	18 45.5
11	16 8 42.80	+1.195	−20 3 29.3	−2.97	18 42.0
12	16 9 11.18	1.170	20 4 39.6	2.89	18 38.5
13	16 9 38.95	1.144	20 5 48.0	2.81	18 35.0
14	16 10 6.10	1.118	20 6 54.3	2.72	18 31.6
15	16 10 32.62	1.092	20 7 58.7	2.64	18 28.1
16	16 10 58.52	+1.066	−20 9 1.1	−2.56	18 24.6
17	16 11 23.78	1.039	20 10 1.6	2.47	18 21.1
18	16 11 48.39	1.012	20 11 0.0	2.39	18 17.6
19	16 12 12.35	0.985	20 11 56.5	2.31	18 14.1
20	16 12 35.65	0.957	20 12 51.0	2.23	18 10.5
21	16 12 58.30	+0.929	−20 13 43.6	−2.15	18 6.9
22	16 13 20.27	0.901	20 14 34.2	2.07	18 3.3
23	16 13 41.57	0.873	20 15 22.9	1.99	17 59.7
24	16 14 2.18	0.845	20 16 9.7	1.91	17 56.1
25	16 14 22.11	0.816	20 16 54.5	1.83	17 52.5
26	16 14 41.34	+0.787	−20 17 37.4	−1.75	17 48.9
27	16 14 59.88	0.758	20 18 18.4	1.67	17 45 3
28	16 15 17.72	0.728	20 18 57.5	1.59	17 41.6
29	16 15 34.84	0.698	20 19 34.6	1.51	17 37.9
30	16 15 51.25	0.668	20 20 9.8	1.43	17 34.3
31	16 16 6.93	+0.638	−20 20 43.2	−1.35	17 30.6
32	16 16 21.89	+0.608	−20 21 14.6	−1.27	17 26.9

Day of the Month.	1st.	9th.	17th.	25th.
Polar Semidiameter . .	15″.5	15″.7	16″.0	16″.3
Horizontal Parallax . .	1.5	1.5	1.5	1.5

Day of the Month.	2d.	10th.	18th.	26th.
Polar Semidiameter . .	16″.7	17″.1	17″.5	17″.9
Horizontal Parallax . .	1.6	1.6	1.6	1.7

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

MARCH.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon*	*Noon.*	
	h m s	s	° ′ ″	″	h m
1	16 15 51.25	+0.668	−20 20 9.8	−1.43	17 34.3
2	16 16 6.93	0.638	20 20 43.2	1.35	17 30.6
3	16 16 21.89	0.608	20 21 14.6	1.27	17 26.9
4	16 16 36.11	0.577	20 21 44.1	1.19	17 23.2
5	16 16 49.59	0.546	20 22 11.7	1.11	17 19.5
6	16 17 2.32	+0 515	−20 22 37.4	−1.03	17 15.7
7	16 17 14.30	0.484	20 23 1.1	0.95	17 12.0
8	16 17 25.52	0.452	20 23 22.9	0.87	17 8.3
9	16 17 35.98	0.420	20 23 42.8	0 79	17 4.5
10	16 17 45.67	0.388	20 24 0.8	0.71	17 0.7
11	16 17 54.59	+0.355	−20 24 16.9	−0.63	16 56.9
12	16 18 2.73	0.323	20 24 31.1	0.55	16 53.1
13	16 18 10.09	0.291	20 24 43.4	0.47	16 49.3
14	16 18 16.67	0.258	20 24 53.8	0.39	16 45.5
15	16 18 22.46	0.225	20 25 2.2	0.31	16 41.6
16	16 18 27.47	+0.192	−20 25 8.8	−0.23	16 37.8
17	16 18 31.70	0.159	20 25 13.5	0.16	16 33.9
18	16 18 35.13	0.127	20 25 16.3	−0.08	16 30.0
19	16 18 37.77	0.095	20 25 17.2	0.00	16 26.1
20	16 18 39.63	0.061	20 25 16.3	+0.08	16 22.2
21	16 18 40.70	+0.028	−20 25 13.5	+0.16	16 18.3
22	16 18 40.97	−0.005	20 25 8.8	0.24	16 14.3
23	16 18 40.46	0.038	20 25 2.3	0.31	16 10.4
24	16 18 39.16	0.071	20 24 53.9	0.39	16 6.4
25	16 18 37.08	0.104	20 24 43.7	0.47	16 2.4
26	16 18 34.21	−0.136	−20 24 31.6	+0.54	15 58.4
27	16 18 30.56	0.169	20 24 17.7	0.62	15 54.4
28	16 18 26.12	0.202	20 24 2.0	0.70	15 50.4
29	16 18 20.91	0.234	20 23 44.5	0.77	15 46.4
30	16 18 14.91	0.267	20 23 25.1	0.85	15 42.4
31	16 18 8.14	−0.299	−20 23 4.0	+0.92	15 38.3
32	16 18 0.59	−0.331	−20 22 41.0	+0.99	15 34.3

Day of the Month.	5th.	13th.	21st.	29th.
Polar Semidiameter . .	18″.3	18″.8	19″.3	19″.8
Horizontal Parallax . .	1.7	1.8	1.8	1.9

APRIL.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m
1	16 18 0.59	−0.331	−20 22 41.0	+0.99	15 34.3
2	16 17 52.26	0.363	20 22 16.2	1.07	15 30.2
3	16 17 43.16	0.395	20 21 49.7	1.15	15 26.1
4	16 17 33.30	0.427	20 21 21.3	1.22	15 22.0
5	16 17 22 68	0.459	20 20 51.2	1.30	15 17.9
6	16 17 11.30	−0.490	−20 20 19.3	+1.37	15 13.8
7	16 16 59.16	0 521	20 19 45.6	1.44	15 9.6
8	16 16 46.28	0.552	20 19 10.1	1.52	15 5.5
9	16 16 32.66	0.583	20 18 32.9	1.59	15 1.3
10	16 16 18.32	0.613	20 17 53.9	1.66	14 57.1
11	16 16 3.25	−0.643	−20 17 13.1	+1.73	14 52.9
12	16 15 47.46	0.672	20 16 30.7	1.80	14 48.7
13	16 15 30.98	0.701	20 15 46.5	1.87	14 44.5
14	16 15 13.81	0.730	20 15 0.7	1.94	14 40.3
15	16 14 55.95	0.758	20 14 13.2	2.01	14 36.0
16	16 14 37.42	−0.786	−20 13 24.1	+2.08	14 31.8
17	16 14 18.23	0.813	20 12 33.3	2.15	14 27.6
18	16 13 58.40	0 839	20 11 40.9	2.22	14 23.3
19	16 13 37.94	0.865	20 10 47.0	2.28	14 19.0
20	16 13 16.86	0.890	20 9 51.5	2.35	14 14.7
21	16 12 55.18	−0.915	−20 8 54.5	+2.41	14 10.4
22	16 12 32.90	0.940	20 7 55.9	2.47	14 6.1
23	16 12 10.04	0.964	20 6 55.9	2.53	14 1.8
24	16 11 46.62	0.987	20 5 54.5	2.59	13 57.5
25	16 11 22.66	1.010	20 4 51.6	2.65	13 53.2
26	16 10 58.16	−1.032	−20 3 47.3	+2.71	13 48.8
27	16 10 33.14	1.053	20 2 41.7	2.77	13 44.5
28	16 10 7.61	1.074	20 1 34.7	2.82	13 40.1
29	16 9 41.60	1.094	20 0 26.4	2.88	13 35.7
30	16 9 15 12	1.113	19 59 16.8	2.93	13 31.4
31	16 8 48.17	−1.132	−19 58 5.9	+2.98	13 27.0
32	16 8 20.79	−1.150	−19 56 53.8	+3.03	13 22.6

Day of the Month.	6th.	14th.	22d.	30th.
Polar Semidiameter . .	20″.2	20″.6	21″.0	21″.2
Horizontal Parallax . .	1.9	1.9	2.0	2.0

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign − indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

MAY.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m
1	16 8 48.17	−1.132	−19 58 5.9	+2.98	13 27.0
2	16 8 20.79	1.150	19 56 53.8	3.03	13 22.6
3	16 7 52.99	1.167	19 55 40.6	3.08	13 18.2
4	16 7 24.78	1.183	19 54 26.2	3.12	13 13.8
5	16 6 56.19	1.199	19 53 10.7	3.17	13 9.3
6	16 6 27.23	−1.214	−19 51 54.1	+3.21	13 4.9
7	16 5 57.93	1.228	19 50 36.5	3.25	13 0 5
8	16 5 28.31	1.241	19 49 18.0	3.29	12 56.1
9	16 4 58.38	1.253	19 47 58.5	3.33	12 51.7
10	16 4 28.17	1.264	19 46 38.1	3.36	12 47.2
11	16 3 57.70	−1.274	−19 45 16.9	+3.40	12 42.8
12	16 3 27.00	1.283	19 43 54.9	3.43	12 38.4
13	16 2 56.08	1.292	19 42 32.2	3.46	12 33.9
14	16 2 24.97	1.299	19 41 8.9	3.49	12 29.5
15	16 1 53.69	1.305	19 39 45.0	3.51	12 25.0
16	16 1 22.26	−1.312	−19 38 20.5	+3.53	12 20.6
17	16 0 50.71	1.317	19 36 55.6	3.55	12 16.1
18	16 0 19.06	1.321	19 35 30.2	3.57	12 11.7
19	15 59 47.34	1.323	19 34 4.5	3.58	12 7.2
20	15 59 15.55	1.325	19 32 38.5	3.59	12 2.8
21	15 58 43.73	−1.326	−19 31 12.3	+3.60	11 58.3
22	15 58 11.90	1.326	19 29 45.9	3.60	11 53.8
23	15 57 40.07	1.326	19 28 19.5	3.60	11 49.3
24	15 57 8.28	1.324	19 26 52.9	3.61	11 44.9
25	15 56 36.54	1.321	19 25 26.4	3.60	11 40.4
26	15 56 4.87	−1.317	−19 24 0.0	+3.60	11 36.0
27	15 55 33.30	1.313	19 22 33.7	3.59	11 31.5
28	15 55 1.83	1.308	19 21 7.6	3.58	11 27.1
29	15 54 30.50	1.302	19 19 41.8	3.57	11 22.6
30	15 53 59.32	1.295	19 18 16.4	3.55	11 18.2
31	15 53 28.32	−1.288	−19 16 51.3	+3.53	11 13.7
32	15 52 57.52	−1.279	−19 15 26.7	+3.51	11 9.3

Day of the Month.	8th.	16th.	24th.	32d.
Polar Semidiameter . .	21″.5	21″.6	21″.6	21″.6
Horizontal Parallax . .	2.0	2.0	2.0	2.0

JUNE.

Day of Month.	Apparent Right Ascension.	Var. of R. A for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m
1	15 52 57.52	−1.279	−19 15 26.7	+3.51	11 9.3
2	15 52 26.93	1.269	19 14 2.6	3.49	11 4.8
3	15 51 56.58	1.259	19 12 39.1	3.46	11 0.4
4	15 51 26.49	1.248	19 11 16.2	3.43	10 56.0
5	15 50 56.67	1.236	19 9 54.1	3.40	10 51.6
6	15 50 27.16	−1.223	−19 8 32.8	+3.37	10 47.1
7	15 49 57.96	1.209	19 7 12.4	3.33	10 42.7
8	15 49 29.11	1.194	19 5 52.9	3.29	10 38.3
9	15 49 0.62	1.179	19 4 34.4	3.25	10 33.9
10	15 48 32.51	1.163	19 3 17.1	3.20	10 29.5
11	15 48 4.81	−1.146	−19 2 0.8	+3.15	10 25.1
12	15 47 37.52	1.128	19 0 45.8	3.10	10 20.8
13	15 47 10.67	1.109	18 59 32.2	3.05	10 16.4
14	15 46 44.27	1.090	18 58 19.8	2.99	10 12.0
15	15 46 18.34	1.070	18 57 8.8	2.93	10 7.7
16	15 45 52.89	−1.049	−18 55 59.3	+2.87	10 3.3
17	15 45 27.94	1.028	18 54 51.3	2.80	9 59.0
18	15 45 3.51	1.007	18 53 44.9	2.73	9 54.6
19	15 44 39.61	0.985	18 52 40.2	2.66	9 50.3
20	15 44 16.24	0.962	18 51 37.2	2.59	9 46.0
21	15 43 53.43	−0.939	−18 50 35.9	+2.52	9 41.7
22	15 43 31.19	0.915	18 49 36.4	2.44	9 37.4
23	15 43 9.53	0.891	18 48 38.7	2 36	9 33.1
24	15 42 48.45	0.866	18 47 42.9	2.28	9 28.8
25	15 42 27.97	0.840	18 46 49.1	2.20	9 24.6
26	15 42 8.11	−0.814	−18 45 57.2	+2.12	9 20.3
27	15 41 48.86	0.789	18 45 7.3	2.03	9 16.1
28	15 41 30.24	0.762	18 44 19.5	1.95	9 11.9
29	15 41 12.26	0.735	18 43 33.7	1.86	9 7.6
30	15 40 54.93	0.708	18 42 50.1	1.77	9 3.4
31	15 40 38.26	−0.680	−18 42 8.7	+1.68	8 59.2
32	15 40 22.26	−0.652	−18 41 29.5	+1.59	8 55.0

Day of the Month.	1st.	9th.	17th.	25th.
Polar Semidiameter . .	21″.6	21″.4	21″.2	20″.9
Horizontal Parallax . .	2.0	2.0	2.0	2.0

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

JULY.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m
1	15 40 38.26	−0.680	−18 42 8.7	+1.68	8 59.2
2	15 40 22.26	0.652	18 41 29.5	1.59	8 55.0
3	15 40 6.93	0.623	18 40 52.4	1.49	8 50.8
4	15 39 52.29	0.595	18 40 17.6	1.40	8 46.6
5	15 39 38.34	0.566	18 39 45.2	1.31	8 42.5
6	15 39 25.09	−0.537	−18 39 15.1	+1.21	8 38.3
7	15 39 12.55	0.507	18 38 47.3	1.11	8 34.2
8	15 39 0.73	0.477	18 38 22.0	1.01	8 30.1
9	15 38 49.63	0.447	18 37 59.1	0.90	8 26.0
10	15 38 39.25	0.417	18 37 38.6	0.80	8 21.9
11	15 38 29.60	−0.387	−18 37 20.6	+0.70	8 17.8
12	15 38 20.70	0.357	18 37 5.2	0.59	8 13.7
13	15 38 12.53	0.325	18 36 52.2	0.49	8 9.6
14	15 38 5.10	0.294	18 36 41.7	0.39	8 5.6
15	15 37 58.42	0.263	18 36 33.7	0.28	8 1.5
16	15 37 52.49	−0.232	−18 36 28.3	+0.18	7 57.5
17	15 37 47.31	0.201	18 36 25.4	+0.07	7 53.5
18	15 37 42.87	0.169	18 36 25.1	−0.04	7 49.5
19	15 37 39.18	0.138	18 36 27.3	0.15	7 45.5
20	15 37 36.25	0.107	18 36 32.1	0.26	7 41.5
21	15 37 34.06	−0.076	−18 36 39.4	−0.36	7 37.6
22	15 37 32.62	0.045	18 36 49.2	0.47	7 33.6
23	15 37 31.92	−0.013	18 37 1.5	0.57	7 29.7
24	15 37 31.98	+0.018	18 37 16.4	0.67	7 25.8
25	15 37 32.79	0.049	18 37 33.8	0.78	7 21.9
26	15 37 34.34	+0.080	−18 37 53.7	−0.89	7 18.0
27	15 37 36.63	0.111	18 38 16.1	0.99	7 14.1
28	15 37 39.67	0.142	18 38 41.0	1.10	7 10.2
29	15 37 43.46	0.173	18 39 8.4	1.20	7 6.3
30	15 37 47.98	0.204	18 39 38.3	1.30	7 2.5
31	15 37 53.25	+0.235	−18 40 10.6	−1.40	6 58.6
32	15 37 59.26	+0.266	−18 40 45.3	−1.50	6 54.8

Day of the Month.	3d.	11th.	19th.	27th.
Polar Semidiameter . .	20″.5	20″.1	19″.7	19″.3
Horizontal Parallax . .	1.9	1.9	1.8	1.8

AUGUST.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m
1	15 37 59.26	+0.266	−18 40 45.3	−1.50	6 54.8
2	15 38 6.02	0.297	18 41 22.5	1.60	6 51.0
3	15 38 13.51	0.328	18 42 2.1	1.70	6 47.2
4	15 38 21.73	0.359	18 42 44.2	1.80	6 43.4
5	15 38 30.70	0.389	18 43 28.7	1.90	6 39.6
6	15 38 40.39	+0.420	−18 44 15.5	−2.00	6 35.8
7	15 38 50.82	0.450	18 45 4.7	2.10	6 32.1
8	15 39 1.96	0.480	18 45 56.2	2.20	6 28.3
9	15 39 13.84	0.510	18 46 50.1	2.30	6 24.6
10	15 39 26.43	0.540	18 47 46.2	2.39	6 20.9
11	15 39 39.74	+0.569	−18 48 44.6	−2.48	6 17.2
12	15 39 53.75	0.599	18 49 45.2	2.57	6 13.5
13	15 40 8.47	0.628	18 50 48.1	2.66	6 9.8
14	15 40 23.90	0.657	18 51 53.1	2.75	6 6.1
15	15 40 40.02	0.686	18 53 0.3	2.84	6 2.5
16	15 40 56.82	+0.715	−18 54 9.6	−2.93	5 58.8
17	15 41 14.31	0.743	18 55 21.0	3.02	5 55.2
18	15 41 32.47	0.771	18 56 34.4	3.11	5 51.6
19	15 41 51.31	0.799	18 57 49.9	3.19	5 47.9
20	15 42 10.82	0.827	18 59 7.3	3.27	5 44.3
21	15 42 31.00	+0.854	−19 0 26.7	−3.35	5 40.7
22	15 42 51.81	0.881	19 1 47.9	3.43	5 37.2
23	15 43 13.29	0.908	19 3 11.0	3.50	5 33.6
24	15 43 35.41	0.935	19 4 36.0	3.58	5 30.0
25	15 43 58.18	0.962	19 6 2.8	3.66	5 26.5
26	15 44 21.58	+0.988	−19 7 31.3	−3.73	5 22.9
27	15 44 45.62	1.015	19 9 1.6	3.80	5 19.4
28	15 45 10.38	1.041	19 10 33.7	3.87	5 15.9
29	15 45 35.56	1.067	19 12 7.3	3.94	5 12.4
30	15 46 1.47	1.093	19 13 42.6	4.01	5 8.9
31	15 46 27.99	+1.118	−19 15 19.5	−4.08	5 5.4
32	15 46 55.11	+1.143	−19 16 58.0	−4.15	5 1.9

Day of the Month.	4th.	12th.	20th.	28th.
Polar Semidiameter . .	18″.8	18″.4	18″.0	17″.6
Horizontal Parallax . .	1.8	1.7	1.7	1.6

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign − indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

SEPTEMBER.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon*	*Noon.*	
	h m s	s	° ′ ″	″	h m
1	15 46 55.11	+1.143	−19 16 58.0	−4.15	5 1.9
2	15 47 22.85	1.168	19 18 38.0	4.21	4 58.4
3	15 47 51.18	1.193	19 20 19.5	4.27	4 54.9
4	15 48 20.11	1.218	19 22 2.5	4.32	4 51.4
5	15 48 49.62	1.242	19 23 46.9	4.38	4 48.0
6	15 49 19.72	+1.266	−19 25 32.7	−4.44	4 44.6
7	15 49 50.40	1.290	19 27 19.9	4.49	4 41.2
8	15 50 21.65	1.314	19 29 8.3	4.55	4 37.8
9	15 50 53.46	1.337	19 30 58.0	4.60	4 34.4
10	15 51 25.82	1.360	19 32 49.0	4.65	4 31.0
11	15 51 58.74	+1.383	−19 34 41.2	−4.70	4 27.6
12	15 52 32.21	1.406	19 36 34.4	4.75	4 24.2
13	15 53 6.21	1.428	19 38 28.9	4.79	4 20.9
14	15 53 40.74	1.450	19 40 24.4	4.84	4 17.5
15	15 54 15.79	1.472	19 42 20.9	4.88	4 14.1
16	15 54 51.36	+1.493	−19 44 18.3	−4.92	4 10.8
17	15 55 27.45	1.514	19 46 16.8	4.96	4 7.5
18	15 56 4.04	1.535	19 48 16.1	4.99	4 4.1
19	15 56 41.12	1.556	19 50 16.2	5.02	4 0.8
20	15 57 18.70	1.576	19 52 17.1	5.06	3 57.5
21	15 57 56.77	+1.596	−19 54 18.9	−5.09	3 54.2
22	15 58 35.32	1.616	19 56 21.4	5.12	3 50.9
23	15 59 14.35	1.636	19 58 24.5	5.15	3 47.6
24	15 59 53.85	1.656	20 0 28.4	5.18	3 44.3
25	16 0 33.82	1.675	20 2 32.9	5.20	3 41.1
26	16 1 14.25	+1.694	−20 4 38.0	−5.23	3 37.8
27	16 1 55.13	1.713	20 6 43.6	5.25	3 34.5
28	16 2 36.47	1.732	20 8 49.7	5.27	3 31.3
29	16 3 18.25	1.751	20 10 56.4	5.29	3 28.1
30	16 4 0.48	1.769	20 13 3.5	5.31	3 24.8
31	16 4 43.14	+1.787	−20 15 11.0	−5.32	3 21.6
32	16 5 26.24	+1.805	−20 17 18.8	−5.34	3 18.4

Day of the Month.	5th.	13th.	21st.	29th.
Polar Semidiameter . .	17″.2	16″.8	16″.5	16″.2
Horizontal Parallax . .	1.6	1.6	1.5	1.5

OCTOBER.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m
1	16 4 43.14	+1.787	−20 15 11.0	−5.32	3 21.6
2	16 5 26 24	1.805	20 17 18.8	5.34	3 18.4
3	16 6 9.75	1.822	20 19 27.1	5.35	3 15.2
4	16 6 53.69	1.839	20 21 35.6	5.36	3 12.0
5	16 7 38.04	1.856	20 23 44.4	5.37	3 8 8
6	16 8 22.80	+1.873	−20 25 53.5	−5.38	3 5.6
7	16 9 7.95	1.890	20 28 2.7	5.39	3 2.5
8	16 9 53.50	1.906	20 30 12.1	5.39	2 59.3
9	16 10 39.44	1.922	20 32 21.6	5.40	2 56.1
10	16 11 25.76	1.938	20 34 31.2	5.40	2 52.9
11	16 12 12.45	+1.953	−20 36 40.9	−5.40	2 49.8
12	16 12 59.51	1.968	20 38 50.5	5.40	2 46.6
13	16 13 46.93	1.983	20 41 0.1	5.40	2 43.4
14	16 14 34.70	1.998	20 43 9.6	5.40	2 40.3
15	16 15 22.82	2.012	20 45 19.0	5.39	2 37.2
16	16 16 11.28	+2.026	−20 47 28.3	−5.38	2 34.1
17	16 17 0.08	2.040	20 49 37.4	5.37	2 31.0
18	16 17 49.21	2.054	20 51 46.2	5.36	2 27.9
19	16 18 38.67	2.067	20 53 54.9	5.35	2 24.8
20	16 19 28.45	2.080	20 56 3.2	5.34	2 21.7
21	16 20 18.54	+2.093	−20 58 11.2	−5.33	2 18.6
22	16 21 8.94	2.106	21 0 18.9	5.31	2 15.5
23	16 21 59.64	2.119	21 2 26.3	5.30	2 12.4
24	16 22 50.65	2.132	21 4 33.2	5.28	2 9.3
25	16 23 41.95	2.144	21 6 39.7	5.26	2 6.2
26	16 24 33 55	+2.156	−21 8 45.8	−5.24	2 3.1
27	16 25 25.42	2.168	21 10 51.4	5.22	2 0.1
28	16 26 17.58	2 179	21 12 56.4	5.20	1 57.0
29	16 27 10.02	2.190	21 15 0.9	5.18	1 53.9
30	16 28 2.72	2.201	21 17 4.9	5.16	1 50.8
31	16 28 55.68	+2.212	−21 19 8.3	−5.13	1 47.8
32	16 29 48.91	+2.223	−21 21 11.1	−5.10	1 44.7

Day of the Month.	7th.	15th.	23d.	31st.
Polar Semidiameter . .	15″.9	15″.7	15″.5	15″.3
Horizontal Parallax . .	1.5	1.5	1.5	1.4

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

NOVEMBER.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m
1	16 29 48.91	+2.223	−21 21 11.1	−5.10	1 44.7
2	16 30 42.39	2.233	21 23 13.2	5.07	1 41.7
3	16 31 36.11	2.243	21 25 14.6	5.04	1 38.7
4	16 32 30.07	2.253	21 27 15.3	5.01	1 35.7
5	16 33 24.26	2.263	21 29 15.3	4.98	1 32.6
6	16 34 18 68	+2.272	−21 31 14.5	−4.95	1 29.6
7	16 35 13.31	2.281	21 33 13.0	4.92	1 26.6
8	16 36 8.16	2.290	21 35 10.6	4.89	1 23.6
9	16 37 3.22	2.298	21 37 7.4	4.85	1 20.5
10	16 37 58.48	2.306	21 39 3.2	4.81	1 17.5
11	16 38 53.93	+2.314	−21 40 58.2	−4.77	1 14.5
12	16 39 49.56	2.322	21 42 52.3	4.73	1 11.5
13	16 40 45.38	2.330	21 44 45.4	4.69	1 8.5
14	16 41 41.38	2.337	21 46 37.5	4.65	1 5.5
15	16 42 37.54	2.344	21 48 28.6	4.61	1 2.5
16	16 43 33.87	+2.351	−21 50 18.7	−4.57	0 59.5
17	16 44 30.36	2.357	21 52 7.8	4.53	0 56.5
18	16 45 27.01	2.363	21 53 55.8	4.48	0 53.5
19	16 46 23.80	2.369	21 55 42.7	4.44	0 50.5
20	16 47 20.74	2.375	21 57 28.5	4.39	0 47.5
21	16 48 17.81	+2.381	−21 59 13.3	−4.34	0 44.5
22	16 49 15.02	2.387	22 0 56.9	4.30	0 41.5
23	16 50 12.36	2.392	22 2 39.3	4.25	0 38.5
24	16 51 9.82	2.397	22 4 20.6	4.20	0 35.6
25	16 52 7.41	2.402	22 6 0.7	4.15	0 32.6
26	16 53 5.10	+2.406	−22 7 39.7	−4.10	0 29.6
27	16 54 2.90	2.410	22 9 17.4	4.05	0 26.6
28	16 55 0.80	2.414	22 10 53.9	4.00	0 23.7
29	16 55 58.80	2.418	22 12 29.1	3.95	0 20.7
30	16 56 56.88	2.422	22 14 3.1	3.89	0 17.7
31	16 57 55.05	+2.425	−22 15 35.8	−3.84	0 14.7
32	16 58 53.29	+2.428	−22 17 7.3	−3.79	0 11.8

DECEMBER.

Day of Month.	Apparent Right Ascension.	Var. of R. A for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m
1	16 57 55.05	+2.425	−22 15 35.8	−3.84	0 14.7
2	16 58 53.29	2.428	22 17 7.3	3.79	0 11.8
3	16 59 51.60	2.431	22 18 37.4	3.73	0 8.9
4	17 0 49.98	2.434	22 20 6.3	3 68	0 5.9
5	17 1 48.41	2.436	22 21 33.7	3.62	0 2.9
6	17 2 46.88	+2.438	−22 22 59.9	−3.56	{0 0.0 / 23 57.0}
7	17 3 45.40	2.439	22 24 24.7	3.51	23 54.1
8	17 4 43.95	2.440	22 25 48.1	3.45	23 51.1
9	17 5 42.53	2.441	22 27 10.2	3.39	23 48.1
10	17 6 41.13	2.442	22 28 30.8	3.33	23 45.2
11	17 7 39.74	+2.443	−22 29 50 1	−3.27	23 42.3
12	17 8 38.37	2.443	22 31 7.9	3.21	23 39.3
13	17 9 37.00	2 443	22 32 24.3	3.16	23 36.3
14	17 10 35.62	2.443	22 33 39.3	3.10	23 33.4
15	17 11 34.24	2.442	22 34 52.9	3.04	23 30.5
16	17 12 32.85	+2.441	−22 36 5.0	−2.98	23 27.5
17	17 13 31.43	2.440	22 37 15.7	2.92	23 24.5
18	17 14 29.99	2.439	22 38 25.0	2.86	23 21.6
19	17 15 28.52	2.438	22 39 32.8	2.80	23 18.6
20	17 16 27.02	2.437	22 40 39.1	2.74	23 15.6
21	17 17 25.47	+2.435	−22 41 44.0	−2.67	23 12.6
22	17 18 23.88	2.433	22 42 47.5	2.61	23 9.7
23	17 19 22.23	2.431	22 43 49.5	2.55	23 6.7
24	17 20 20.53	2.428	22 44 50.0	2.49	23 3.7
25	17 21 18.76	2.425	22 45 49.1	2.43	23 0.7
26	17 22 16.92	+2.422	−22 46 46.8	−2.37	22 57.8
27	17 23 15.00	2.418	22 47 43.0	2.31	22 54.9
28	17 24 13.00	2.414	22 48 37.7	2.25	22 51.9
29	17 25 10.90	2.410	22 49 31.0	2.19	22 48.9
30	17 26 8.71	2.406	22 50 22.9	2.13	22 46.0
31	17 27 6.41	+2.402	−22 51 13.2	−2.07	22 43.0
32	17 28 4.00	+2.397	−22 52 2.2	−2.01	22 40.0

Day of the Month.	8th.	16th.	24th.	32d.
Polar Semidiameter . .	15″.2	15″.1	15″.0	15″.0
Horizontal Parallax . .	1.4	1.4	1.4	1.4

Day of the Month.	2d.	10th.	18th.	26th.	34th.
Polar Semidiameter .	15″.0	15″.0	15″.0	15″.1	15″.2
Horizontal Parallax . .	1.4	1.4	1.4	1.4	1.4

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign − indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

JANUARY.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	8 29 7.67	−0.723	+19 31 1.2	+2.87	13 44.4
2	8 28 50.18	0.734	19 32 10.5	2.90	13 40.2
3	8 28 32.45	0.744	19 33 20.5	2.93	13 35.9
4	8 28 14.49	0.753	19 34 31.1	2.95	13 31.7
5	8 27 56.31	0.762	19 35 42.3	2.98	13 27.5
6	8 27 37.90	−0.771	+19 36 54.1	+3.00	13 23.2
7	8 27 19.30	0.779	19 38 6.4	3.02	13 19.0
8	8 27 0.51	0.787	19 39 19.2	3.04	13 14.8
9	8 26 41.53	0.794	19 40 32.5	3.06	13 10.5
10	8 26 22.38	0.801	19 41 46.1	3.07	13 6.3
11	8 26 3.06	−0.808	+19 43 0.1	+3.09	13 2.0
12	8 25 43.60	0.814	19 44 14.3	3.10	12 57.7
13	8 25 24.01	0.819	19 45 28.8	3.11	12 53.5
14	8 25 4.28	0.824	19 46 43.6	3.12	12 49.2
15	8 24 44.44	0.829	19 47 58.5	3.12	12 44.9
16	8 24 24.50	−0.833	+19 49 13.5	+3.13	12 40.7
17	8 24 4.47	0.836	19 50 28.6	3.13	12 36.4
18	8 23 44.36	0.839	19 51 43.8	3.13	12 32.1
19	8 23 24.19	0.842	19 52 59 0	3.13	12 27.9
20	8 23 3.97	0.843	19 54 14.1	3.13	12 23.6
21	8 22 43.71	−0.845	+19 55 29.2	+3.12	12 19.3
22	8 22 23.42	0.846	19 56 44.1	3.12	12 15.1
23	8 22 3.11	0.846	19 57 58.8	3.11	12 10.8
24	8 21 42.79	0.846	19 59 13.3	3.10	12 6.6
25	8 21 22.48	0.846	20 0 27.6	3.09	12 2.3
26	8 21 2.19	−0.845	+20 1 41.6	+3.08	11 58.0
27	8 20 41.93	0.843	20 2 55.3	3.06	11 53.7
28	8 20 21.71	0.841	20 4 8.6	3.05	11 49.5
29	8 20 1.54	0.839	20 5 21.5	3.03	11 15 2
30	8 19 41.43	0.836	20 6 33.9	3.01	11 40.9
31	8 19 21.39	−0.833	+20 7 45.9	+2.99	11 36.7
32	8 19 1.44	−0.829	+20 8 57.4	+2.97	11 32.4

Day of the Month.	1st.	9th.	17th.	25th.
Polar Semidiameter . .	″9.6	″9.6	″9.6	″9.6
Horizontal Parallax . .	1.1	1.1	1.1	1.1

FEBRUARY.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	8 19 1.44	−0.829	+20 8 57.4	+2.97	11 32.4
2	8 18 41.59	0.822	20 10 8.3	2.94	11 28.2
3	8 18 21.84	0.820	20 11 18.6	2.92	11 23.9
4	8 18 2.21	0.815	20 12 28.3	2.89	11 19.6
5	8 17 42.71	0.810	20 13 37.4	2.86	11 15.4
6	8 17 23.35	−0.804	+20 14 45.8	+2.83	11 11.1
7	8 17 4.14	0.797	20 15 53.5	2.81	11 6.9
8	8 16 45.10	0.790	20 17 0.4	2.77	11 2.6
9	8 16 26.23	0.782	20 18 6.5	2.74	10 58.4
10	8 16 7.54	0.774	20 19 11.8	2.70	10 54.2
11	8 15 49.06	−0.766	+20 20 16.3	+2.67	10 49.9
12	8 15 30.78	0.757	20 21 19.9	2.63	10 45.7
13	8 15 12.72	0.748	20 22 22.5	2.59	10 41.5
14	8 14 54.89	0.738	20 23 24.2	2.55	10 37.2
15	8 14 37.30	0.728	20 24 25.0	2.51	10 33.0
16	8 14 19.96	−0.717	+20 25 24.8	+2.47	10 28.8
17	8 14 2.89	0.706	20 26 23.5	2.43	10 24.6
18	8 13 46.08	0.694	20 27 21.3	2.38	10 20.4
19	8 13 29.56	0.682	20 28 17.9	2.34	10 16.2
20	8 13 13.32	0.670	20 29 13.5	2.29	10 12.0
21	8 12 57.38	−0.658	+20 30 8.0	+2.25	10 7.8
22	8 12 41.74	0.645	20 31 1.3	2.20	10 3.6
23	8 12 26.42	0.632	20 31 53.6	2.15	9 59.4
24	8 12 11.42	0.618	20 32 44.6	2.10	9 55.2
25	8 11 56.74	0.605	20 33 34.5	2.05	9 51.1
26	8 11 42.39	−0.591	+20 34 23.2	+2.00	9 46.9
27	8 11 28.39	0.576	20 35 10.6	1.95	9 42.7
28	8 11 14.74	0.562	20 35 56.8	1.90	9 38.6
29	8 11 1.44	0.547	20 36 41.8	.85	9 34.4
30	8 10 48.50	0.531	20 37 25.5	.79	9 30.3
31	8 10 35.93	−0.516	+20 38 7.9	+1.74	9 26.1
32	8 10 23.73	−0.500	+20 38 49.1	+1.69	9 22.0

Day of the Month.	2d.	10th.	18th.	26th.
Polar Semidiameter . .	″9.6	″9.6	″9.5	″9.4
Horizontal Parallax . .	1.1	1.1	1.1	1.1

NOTE.—The sign + indicates north declinations: the sign — indicates south declinations.

GREENWICH MEAN TIME.

MARCH.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m
1	8 10 48.50	−0.531	+20 37 25.5	+1.79	9 30.3
2	8 10 35.93	0.516	20 38 7.9	1.74	9 26.1
3	8 10 23.73	0.500	20 38 49.1	1.69	9 22.0
4	8 10 11.91	0.484	20 39 29.0	1.63	9 17.9
5	8 10 0.48	0.468	20 40 7.6	1.58	9 13.7
6	8 9 49.44	−0.452	+20 40 44.9	+1.52	9 9.6
7	8 9 38.80	0.435	20 41 20.8	1.47	9 5.5
8	8 9 28.56	0.418	20 41 55.4	1.41	9 1.4
9	8 9 18.73	0.401	20 42 28.6	1.36	8 57.3
10	8 9 9.32	0.384	20 43 0.5	1.30	8 53.3
11	8 9 0.32	−0.366	+20 43 31.0	+1.24	8 49.2
12	8 8 51.75	0.348	20 44 0.1	1.18	8 45.1
13	8 8 43.61	0.330	20 44 27.8	1.13	8 41.1
14	8 8 35.90	0.312	20 44 54.1	1.07	8 37.0
15	8 8 28.63	0.294	20 45 19.1	1.01	8 33.0
16	8 8 21.80	−0.275	+20 45 42.6	+0.95	8 28.9
17	8 8 15.41	0.257	20 46 4.7	0.89	8 24.9
18	8 8 9.47	0.238	20 46 25.4	0.83	8 20.8
19	8 8 3.97	0.220	20 46 44.7	0.78	8 16.8
20	8 7 58.93	0.201	20 47 2.6	0.72	8 12.8
21	8 7 54.33	−0.182	+20 47 19 1	+0.66	8 8.8
22	8 7 50.19	0 163	20 47 34.1	0.60	8 4.8
23	8 7 46.50	0.144	20 47 47.7	0.54	8 0.8
24	8 7 43.27	0.125	20 47 59.9	0.48	7 56.8
25	8 7 40.49	0.106	20 48 10.7	0.42	7 52.9
26	8 7 38.17	−0.087	+20 48 20.1	+0.36	7 48.9
27	8 7 36.31	0.068	20 48 28.0	0.30	7 44.9
28	8 7 34.90	0.049	20 48 34.5	0.24	7 41.0
29	8 7 33 95	0.030	20 48 39.6	0.18	7 37.0
30	8 7 33.46	−0.011	20 48 43.3	0.12	7 33.1
31	8 7 33.42	+0.008	+20 48 45.6	+0.07	7 29.2
32	8 7 33.85	+0.027	+20 48 46.5	+0.01	7 25.2

APRIL.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m
1	8 7 33.85	+0.027	+20 48 46.5	+0.01	7 25.2
2	8 7 34.73	0.046	20 48 45.9	−0.05	7 21.3
3	8 7 36.07	0.065	20 48 43.9	0.11	7 17.4
4	8 7 37.87	0.084	20 48 40.6	0.17	7 13.5
5	8 7 40.13	0.103	20 48 35.8	0.23	7 9.6
6	8 7 42.84	+0.123	+20 48 29.6	−0.29	7 5.7
7	8 7 46.02	0.142	20 48 21.9	0.35	7 1.9
8	8 7 49.65	0.161	20 48 12.9	0.41	6 58.0
9	8 7 53.73	0.180	20 48 2.5	0.47	6 54.1
10	8 7 58.28	0 199	20 47 50.7	0.52	6 50.3
11	8 8 3.27	+0.218	+20 47 37.4	−0.58	6 46.4
12	8 8 8.72	0.237	20 47 22.8	0.64	6 42.6
13	8 8 14.62	0.255	20 47 6.8	0.70	6 38.8
14	8 8 20.97	0.274	20 46 49.4	0.76	6 34.9
15	8 8 27.77	0.293	20 46 30.6	0.82	6 31.1
16	8 8 35.00	+0.311	+20 46 10.5	−0.87	6 27.3
17	8 8 42.68	0.329	20 45 49.0	0.92	6 23.5
18	8 8 50.80	0.347	20 45 26.1	0.98	6 19.7
19	8 8 59.35	0.365	20 45 1.9	1.04	6 15.9
20	8 9 8.33	0.383	20 44 36.3	1.10	6 12.1
21	8 9 17.73	+0.401	+20 44 9.3	−1.16	6 8.4
22	8 9 27.57	0.419	20 43 41.1	1.21	6 4.6
23	8 9 37.83	0.436	20 43 11.5	1.27	6 0.9
24	8 9 48.50	0.453	20 42 40.5	1.32	5 57.1
25	8 9 59.58	0.470	20 42 8.3	1.38	5 53.4
26	8 10 11.07	+0.487	+20 41 34.7	−1.43	5 49.6
27	8 10 22.98	0.505	20 40 59.8	1.48	5 45.9
28	8 10 35.28	0.521	20 40 23.6	1.54	5 42.2
29	8 10 47.99	0.538	20 39 46.2	1.59	5 38.4
30	8 11 1.10	0.554	20 39 7.4	1.65	5 34.7
31	8 11 14.60	+0.571	+20 38 27.3	−1.70	5 31.0
32	8 11 28.50	+0.587	+20 37 46.0	−1.75	5 27.3

Day of the Month.	5th.	13th.	21st.	29th.
Polar Semidiameter . .	9″.3	9″.2	9″.1	9″.0
Horizontal Parallax .	1.1	1.0	1.0	1.0

Day of the Month.	6th.	14th.	22d.	30th.
Polar Semidiameter . .	8″.9	8″.7	8″.6	8″.5
Horizontal Parallax . .	1.0	1.0	1.0	1.0

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

MAY.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m
1	8 11 14.60	+0.571	+20 38 27.3	−1.70	5 31.0
2	8 11 28.50	0.587	20 37 46.0	1.75	5 27.3
3	8 11 42.78	0.603	20 37 3.4	1.81	5 23.6
4	8 11 57.45	0.619	20 36 19.5	1.86	5 19.9
5	8 12 12.50	0.635	20 35 34.3	1.91	5 16.2
6	8 12 27.93	+0.651	+20 34 47.9	−1.96	5 12.5
7	8 12 43.73	0.666	20 34 0.2	2.01	5 8.9
8	8 12 59.91	0.682	20 33 11.2	2.07	5 5.3
9	8 13 16.46	0.697	20 32 21.0	2.12	5 1.6
10	8 13 33.37	0.712	20 31 29.6	2.17	4 58.0
11	8 13 50.63	+0 727	+20 30 37.0	−2.22	4 54.3
12	8 14 8.25	0.741	20 29 43.2	2.27	4 50.7
13	8 14 26.23	0.756	20 28 48.1	2.32	4 47.0
14	8 14 44.55	0.770	20 27 51.8	2.37	4 43.4
15	8 15 3.21	0.785	20 26 54.3	2.42	4 39.8
16	8 15 22.21	+0.799	+20 25 55.6	−2.47	4 36.2
17	8 15 41.54	0.812	20 24 55.8	2.52	4 32.6
18	8 16 1.19	0.826	20 23 54.8	2.57	4 29.0
19	8 16 21.17	0.839	20 22 52.6	2.62	4 25.4
20	8 16 41.46	0.852	20 21 49.2	2.67	4 21.8
21	8 17 2.07	+0.865	+20 20 44.7	−2.72	4 18.2
22	8 17 22.98	0.878	20 19 39.1	2.76	4 14.6
23	8 17 44.20	0.890	20 18 32.4	2.81	4 11.0
24	8 18 5.72	0.903	20 17 24.5	2.85	4 7.4
25	8 18 27.53	0.915	20 16 15.5	2.90	4 3.8
26	8 18 49.62	+0.927	+20 15 5.4	−2.94	4 0.3
27	8 19 12.00	0.938	20 13 54.1	2.99	3 56.7
28	8 19 34.67	0.950	20 12 41.9	3.04	3 53.2
29	8 19 57.61	0.962	20 11 28.5	3.08	3 49.6
30	8 20 20.83	0.973	20 10 14.0	3.12	3 46.1
31	8 20 44.31	+0.984	+20 8 58.5	−3.17	3 42.5
32	8 21 8.06	+0.995	+20 7 41.9	−3.21	3 39.0

JUNE.

Day of Month.	Apparent Right Ascension.	Var. of R. A for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m
1	8 21 8.06	+0.995	+20 7 41.9	−3.21	3 39.0
2	8 21 32.07	1.006	20 6 24.2	3.26	3 35.4
3	8 21 56.34	1.016	20 5 5.5	3.30	3 31.9
4	8 22 20.86	1.027	20 3 45.8	3.35	3 28.4
5	8 22 45.63	1.037	20 2 25.0	3.39	3 24.9
6	8 23 10.64	+1.047	+20 1 3.2	−3.43	3 21.4
7	8 23 35.89	1.057	19 59 40.4	3.47	3 17.9
8	8 24 1.38	1.067	19 58 16.6	3.51	3 14.4
9	8 24 27.11	1.077	19 56 51.8	3.55	3 10.9
10	8 24 53.05	1.086	19 55 26.0	3.59	3 7.4
11	8 25 19.21	+1.095	+19 53 59.3	−3.63	3 3.9
12	8 25 45.59	1.103	19 52 31.6	3.67	3 0.4
13	8 26 12.18	1.112	19 51 3.0	3.71	2 56.9
14	8 26 38.98	1.121	19 49 33.4	3.75	2 53.4
15	8 27 5.97	1.129	19 48 2.9	3.79	2 49.9
16	8 27 33.16	+1.137	+19 46 31.4	−3.83	2 46.4
17	8 28 0.54	1.145	19 44 59.0	3.87	2 42.9
18	8 28 28.11	1.152	19 43 25.8	3.91	2 39.4
19	8 28 55.85	1.159	19 41 51.7	3.95	2 36.0
20	8 29 23.77	1.167	19 40 16.7	3.98	2 32.5
21	8 29 51.86	+1.174	+19 38 40.9	−4.01	2 29.1
22	8 30 20.12	1.181	19 37 4.2	4.05	2 25.6
23	8 30 48.54	1.188	19 35 26.6	4.08	2 22.1
24	8 31 17.12	1.195	19 33 48.2	4.12	2 18.6
25	8 31 45.86	1.201	19 32 9.1	4.15	2 15.2
26	8 32 14.74	+1.207	+19 30 29.1	−4.18	2 11.7
27	8 32 43.77	1.213	19 28 48.3	4.22	2 8.3
28	8 33 12.95	1.218	19 27 6.7	4.25	2 4.8
29	8 33 42.26	1.224	19 25 24.4	4.28	2 1.4
30	8 34 11.71	1.230	19 23 41.3	4.31	1 57.9
31	8 34 41.29	+1.235	+19 21 57.4	−4.34	1 54.5
32	8 35 10.99	+1.240	+19 20 12.8	−4.37	1 51.1

Day of the Month.	8th.	16th.	24th.	32d.
Polar Semidiameter . .	8″.3	8″.2	8″.1	8″.0
Horizontal Parallax . .	1.0	0.9	0.9	0.9

Day of the Month.	1st.	9th.	17th.	25th.
Polar Semidiameter . .	8″.0	8″.0	7″.9	7″.8
Horizontal Parallax . .	0.9	0.9	0.9	0.9

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

JULY.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m
1	8 34 41.29	+1.235	+19 21 57.4	−4.34	1 54.5
2	8 35 10.99	1.240	19 20 12.8	4.37	1 51.1
3	8 35 40.82	1.245	19 18 27.5	4.40	1 47.7
4	8 36 10.77	1.250	19 16 41.5	4.43	1 44.2
5	8 36 40.83	1.255	19 14 54.7	4.46	1 40.8
6	8 37 11.00	+1.259	+19 13 7.3	−4.49	1 37.3
7	8 37 41.27	1.263	19 11 19.2	4.52	1 33.9
8	8 38 11.64	1.267	19 9 30.5	4.55	1 30.4
9	8 38 42.11	1.271	19 7 41.1	4.57	1 27.0
10	8 39 12.66	1.275	19 5 51.0	4.60	1 23.6
11	8 39 43.31	+1.279	+19 4 0.4	−4.62	1 20.2
12	8 40 14.03	1.282	19 2 9.1	4.65	1 16.8
13	8 40 44.83	1.285	19 0 17.3	4.67	1 13.4
14	8 41 15.69	1.288	18 58 24.9	4.70	1 10.0
15	8 41 46.63	1.290	18 56 31.9	4.72	1 6.6
16	8 42 17.63	+1.293	+18 54 38.4	−4.74	1 3.1
17	8 42 48.68	1.295	18 52 44.4	4.76	0 59.7
18	8 43 19.79	1.297	18 50 49.8	4.78	0 56.3
19	8 43 50.95	1.299	18 48 54.8	4.80	0 52.9
20	8 44 22.15	1.301	18 46 59.3	4.82	0 49.4
21	8 44 53.39	+1.302	+18 45 3.3	−4.84	0 46.0
22	8 45 24.66	1.304	18 43 6.9	4.86	0 42.6
23	8 45 55.97	1.305	18 41 10.1	4.88	0 39.2
24	8 46 27.31	1.306	18 39 12.8	4.89	0 35.7
25	8 46 58.67	1.307	18 37 15.1	4.91	0 32.3
26	8 47 30.05	+1.308	+18 35 17.1	−4.92	0 28.9
27	8 48 1.46	1.309	18 33 18.7	4.94	0 25.5
28	8 48 32.88	1.309	18 31 19.9	4.95	0 22.1
29	8 49 4.30	1.309	18 29 20.8	4.96	0 18.7
30	8 49 35.73	1.310	18 27 21.4	4.97	0 15.3
31	8 50 7.17	+1.310	+18 25 21.6	−4.98	0 11.9
32	8 50 38.60	+1.310	+18 23 21.5	−5.00	0 8.5

Day of the Month.	3d.	11th.	19th.	27th.
Polar Semidiameter . .	7″.8	7″.7	7″.7	7″.7
Horizontal Parallax . .	0.9	0.9	0.9	0.9

AUGUST.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m
1	8 50 38.60	+1.310	+18 23 21.5	−5.00	0 8.5
2	8 51 10.02	1.309	18 21 21.2	5.01	0 5.1
3	8 51 41.43	1.309	18 19 20.7	5.02	{0 1.7 / 23 58.3}
4	8 52 12.83	1.308	18 17 19.9	5.03	23 54.9
5	8 52 44.21	1.307	18 15 18.9	5.04	23 51.5
6	8 53 15.57	+1.306	+18 13 17.7	−5.05	23 48.1
7	8 53 46.89	1.305	18 11 16.3	5.06	23 44.6
8	8 54 18.18	1.303	18 9 14.8	5.07	23 41.2
9	8 54 49.43	1.301	18 7 13.1	5.07	23 37.8
10	8 55 20.64	1.299	18 5 11.3	5.08	23 34.4
11	8 55 51.79	+1.297	+18 3 9.4	−5.08	23 30.9
12	8 56 22.90	1.295	18 1 7.5	5.08	23 27.5
13	8 56 53.96	1.292	17 59 5.5	5.08	23 24.1
14	8 57 24.94	1.290	17 57 3.5	5.08	23 20.7
15	8 57 55.86	1.287	17 55 1.4	5.08	23 17.3
16	8 58 26.71	+1.284	+17 52 59.4	−5.08	23 13.9
17	8 58 57.49	1.281	17 50 57.4	5.08	23 10.5
18	8 59 28.19	1.277	17 48 55.4	5.08	23 7.1
19	8 59 58.80	1.274	17 46 53.5	5.08	23 3.6
20	9 0 29.34	1.271	17 44 51.7	5.07	23 0.2
21	9 0 59.79	+1.267	+17 42 50.0	−5.07	22 56.8
22	9 1 30.14	1.263	17 40 48.4	5.06	22 53.4
23	9 2 0.39	1.259	17 38 47.0	5.06	22 49.9
24	9 2 30.55	1.254	17 36 45.8	5.05	22 46.5
25	9 3 0.60	1.250	17 34 44.7	5.04	22 43.1
26	9 3 30.54	+1.245	+17 32 43.9	−5.03	22 39.7
27	9 4 0.37	1.241	17 30 43.3	5.02	22 36.2
28	9 4 30.08	1.236	17 28 43.0	5.01	22 32.8
29	9 4 59.68	1.230	17 26 42.9	5.00	22 29.3
30	9 5 29.14	1.225	17 24 43.1	4.98	22 25.9
31	9 5 58.48	+1.220	+17 22 43.7	−4.97	22 22.4
32	9 6 27.69	+1.214	+17 20 44.5	−4.96	22 19.0

Day of the Month.	4th.	12th.	20th.	28th.
Polar Semidiameter . .	7″.7	7″.7	7″.7	7″.8
Horizontal Parallax . .	0.9	0.9	0.9	0.9

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign − indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

SEPTEMBER.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	9 6 27.69	+1.214	+17 20 44.5	−4.96	22 19.0
2	9 6 56.76	1.208	17 18 45.8	4.94	22 15.5
3	9 7 25.69	1.202	17 16 47.5	4.93	22 12.1
4	9 7 54.46	1.196	17 14 49.6	4.91	22 8.6
5	9 8 23.08	1.189	17 12 52.1	4.89	22 5.2
6	9 8 51.55	+1.183	+17 10 55.1	−4.87	22 1.7
7	9 9 19.85	1.176	17 8 58.6	4.85	21 58.2
8	9 9 47.99	1.169	17 7 2.6	4.83	21 54.7
9	9 10 15.96	1.162	17 5 7.2	4.80	21 51.3
10	9 10 43.75	1.154	17 3 12.3	4.78	21 47.8
11	9 11 11.35	+1.146	+17 1 18.1	−4.75	21 44.3
12	9 11 38.77	1.139	16 59 24.5	4.73	21 40.8
13	9 12 6.01	1.131	16 57 31.5	4.70	21 37.4
14	9 12 33.06	1.123	16 55 39.1	4.67	21 33.9
15	9 12 59.90	1.114	16 53 47.5	4.64	21 30.4
16	9 13 26.54	+1.106	+16 51 56.7	−4.61	21 26.9
17	9 13 52.99	1.097	16 50 6.5	4.58	21 23.4
18	9 14 19.22	1.089	16 48 17.1	4.55	21 19.9
19	9 14 45.24	1.080	16 46 28.5	4.51	21 16.4
20	9 15 11.04	1.070	16 44 40.8	4.48	21 12.9
21	9 15 36.63	+1.061	+16 42 53.8	−4.44	21 9.4
22	9 16 1.99	1.052	16 41 7.7	4.41	21 5.9
23	9 16 27.12	1.043	16 39 22.6	4.37	21 2.4
24	9 16 52.02	1.033	16 37 38.3	4.33	20 58.8
25	9 17 16.69	1.023	16 35 55.0	4.29	20 55.3
26	9 17 41.12	+1.013	+16 34 12.6	−4.25	20 51.8
27	9 18 5.29	1.002	16 32 31.3	4.21	20 48.3
28	9 18 29.22	0.992	16 30 50.9	4.17	20 44.7
29	9 18 52.90	0.981	16 29 11.6	4.12	20 41.2
30	9 19 16.32	0.970	16 27 33.4	4.08	20 37.6
31	9 19 39.47	+0.959	+16 25 56.3	−4.03	20 34.1
32	9 20 2.36	+0.948	+16 24 20.3	−3.98	20 30.5

OCTOBER.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	9 19 39.47	+0.959	+16 25 56.3	−4.03	20 34.1
2	9 20 2.36	0.948	16 24 20.3	3.98	20 30.5
3	9 20 24.97	0.937	16 22 45.4	3.93	20 27.0
4	9 20 47.31	0.925	16 21 11.7	3.88	20 23.4
5	9 21 9.36	0.913	16 19 39.3	3.83	20 19.8
6	9 21 31.12	+0.901	+16 18 8.1	−3.78	20 16.2
7	9 21 52.60	0.888	16 16 38.1	3.73	20 12.6
8	9 22 13.78	0.876	16 15 9.5	3.67	20 9.0
9	9 22 34.66	0.863	16 13 42.2	3.61	20 5.4
10	9 22 55.23	0.851	16 12 16.2	3.56	20 1.8
11	9 23 15.50	+0.838	+16 10 51.5	−3.50	19 58.2
12	9 23 35.45	0.825	16 9 28.3	3.44	19 54.6
13	9 23 55.09	0.811	16 8 6.5	3.38	19 51.0
14	9 24 14.40	0.798	16 6 46.1	3.32	19 47.4
15	9 24 33.40	0.784	16 5 27.2	3.26	19 43.8
16	9 24 52.07	+0.771	+16 4 9.8	−3.20	19 40.2
17	9 25 10.40	0.757	16 2 53.9	3.13	19 36.6
18	9 25 28.41	0.743	16 1 39.5	3.07	19 32.9
19	9 25 46.08	0.729	16 0 26.7	3.00	19 29.3
20	9 26 3.41	0.715	15 59 15.4	2.94	19 25.6
21	9 26 20.39	+0.700	+15 58 5.8	−2.87	19 22.0
22	9 26 37.02	0.686	15 56 57.7	2.80	19 18.3
23	9 26 53.31	0.671	15 55 51.3	2.73	19 14.7
24	9 27 9.24	0.656	15 54 46.6	2.66	19 11.0
25	9 27 24.81	0.641	15 53 43.6	2.59	19 7.3
26	9 27 40.01	+0.626	+15 52 42.3	−2.52	19 3.6
27	9 27 54.85	0.611	15 51 42.7	2.45	18 59.9
28	9 28 9.31	0.595	15 50 44.9	2.38	18 56.2
29	9 28 23.40	0.579	15 49 48.9	2.30	18 52.5
30	9 28 37.10	0.563	15 48 54.7	2.23	18 48.8
31	9 28 50.43	+0.547	+15 48 2.3	−2.15	18 45.1
32	9 29 3.37	+0.531	+15 47 11.8	−2.07	18 41.3

Day of the Month.	5th.	13th.	21st.	29th.
Polar Semidiameter . .	″7.8	″7.9	″7.9	″8.0
Horizontal Parallax . .	0.9	0.9	0.9	0.9

Day of the Month.	7th.	15th.	23d.	31st.
Polar Semidiameter . .	″8.1	″8.2	″8.3	″8.4
Horizontal Parallax . .	0.9	0.9	0.9	0.9

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

NOVEMBER.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	9 29 3.37	+0.531	+15 47 11.8	−2.07	18 41.3
2	9 29 15.91	0.514	15 46 23.2	1.99	18 37.6
3	9 29 28.06	0.498	15 45 36.4	1.91	18 33.9
4	9 29 39.82	0.481	15 44 51.6	1.83	18 30.1
5	9 29 51.17	0.465	15 44 8.7	1.75	18 26.4
6	9 30 2.12	+0.448	+15 43 27.8	−1.67	18 22.6
7	9 30 12.66	0.431	15 42 48.8	1.59	18 18.9
8	9 30 22.79	0.413	15 42 11.8	1.50	18 15.1
9	9 30 32.51	0.396	15 41 36.8	1.42	18 11.3
10	9 30 41.81	0.379	15 41 3.8	1.34	18 7.5
11	9 30 50.70	+0.361	+15 40 32.9	−1.25	18 3.7
12	9 30 59.16	0.344	15 40 4.0	1.17	17 59.9
13	9 31 7.21	0.327	15 39 37.1	1.08	17 56.1
14	9 31 14.83	0.309	15 39 12.3	1.00	17 52.3
15	9 31 22.03	0.291	15 38 49.6	0.91	17 48.5
16	9 31 28.81	+0.273	+15 38 28.9	−0.82	17 44.7
17	9 31 35.16	0.255	15 38 10.4	0.73	17 40.9
18	9 31 41.08	0.238	15 37 53.9	0.64	17 37.0
19	9 31 46.56	0.230	15 37 39.6	0.56	17 33.2
20	9 31 51.62	0.202	15 37 27.3	0.47	17 29.3
21	9 31 56.24	+0.183	+15 37 17.2	−0.38	17 25.5
22	9 32 0.43	0.165	15 37 9.2	0.29	17 21.6
23	9 32 4.18	0.147	15 37 3.4	0.20	17 17.7
24	9 32 7.49	0.129	15 36 59.7	0.11	17 13.8
25	9 32 10.36	0.110	15 36 58.1	−0.02	17 9.9
26	9 32 12.78	+0.092	+15 36 58.8	+0.07	17 6.0
27	9 32 14.76	0.073	15 37 1.6	0.16	17 2.1
28	9 32 16.30	0.055	15 37 6.5	0.25	16 58.2
29	9 32 17.39	0.036	15 37 13.6	0.34	16 54.3
30	9 32 18.04	+0.018	15 37 22.9	0.43	16 50.4
31	9 32 18.24	−0.001	+15 37 34.3	+0.52	16 46.5
32	9 32 17.99	−0.020	+15 37 47.9	+0.61	16 42.5

Day of the Month.	8th.	16th.	24th.	32d.
Polar Semidiameter . .	″ 8.5	″ 8.7	″ 8.8	″ 8.9
Horizontal Parallax . .	1.0	1.0	1.0	1.0

DECEMBER.

Day of Month.	Apparent Right Ascension.	Var. of R. A for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ″	″	h m
1	9 32 18.24	−0 001	+15 37 34.3	+0.52	16 46.5
2	9 32 17.99	0.020	15 37 47.9	0.61	16 42.5
3	9 32 17.30	0 038	15 38 3.7	0.70	16 38.6
4	9 32 16.16	0 057	15 38 21.6	0.79	16 34.6
5	9 32 14.58	0.075	15 38 41.6	0.88	16 30.6
6	9 32 12.55	−0.094	+15 39 3.8	+0.97	16 26.7
7	9 32 10.08	0.112	15 39 28.2	1.06	16 22.7
8	9 32 7.18	0.130	15 39 54.6	1.15	16 18.7
9	9 32 3.83	0.148	15 40 23.2	1.24	16 14.7
10	9 32 0.05	0.167	15 40 53.8	1.33	16 10.7
11	9 31 55.83	−0.185	+15 41 26.5	+1.41	16 6.7
12	9 31 51.18	0.203	15 42 1.3	1.50	16 2.7
13	9 31 46.11	0.220	15 42 38.1	1.58	15 58.7
14	9 31 40.61	0.238	15 43 16.9	1.67	15 54.6
15	9 31 34.68	0.256	15 43 57.8	1.75	15 50.6
16	9 31 28.33	−0.273	+15 44 40.6	+1.83	15 46.6
17	9 31 21.57	0 290	15 45 25.4	1.91	15 42.5
18	9 31 14.39	0.308	15 46 12.1	1.99	15 38.5
19	9 31 6.80	0.325	15 47 0.8	2.07	15 34.4
20	9 30 58.80	0.342	15 47 51.3	2.15	15 30.3
21	9 30 50.40	−0.358	+15 48 43.8	+2.23	15 26.3
22	9 30 41.60	0.375	15 49 38.1	2.31	15 22.2
23	9 30 32.40	0.392	15 50 34.2	2.38	15 18.1
24	9 30 22.80	0.408	15 51 32.1	2 45	15 14.0
25	9 30 12.82	0.424	15 52 31.8	2.52	15 9.9
26	9 30 2.45	- 0 440	+15 53 33.2	+2.59	15 5.8
27	9 29 51.69	0.456	15 54 36.3	2.66	15 1.7
28	9 29 40.57	0.471	15 55 41.1	2.73	14 57.6
29	9 29 29.07	0.486	15 56 47.6	2.80	14 53.4
30	9 29 17.20	0.502	15 57 55.7	2.87	14 49.3
31	9 29 4.98	−0.517	+15 59 5.4	+2.93	14 45.2
32	9 28 52.41	−0.531	+16 0 16.6	+3.00	14 41.0

Day of the Month.	2d.	10th.	18th.	26th.	34th.
Polar Semidiameter . .	″ 8.9	″ 9.0	″ 9.2	″ 9.3	″ 9.4
Horizontal Parallax . .	1.0	1.0	1.0	1.0	1.1

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. of R. A. for 1 Day.	Apparent Declination.	Var. of Decl. for 1 Day.	Meridian Passage.	Date.	Apparent Right Ascension.	Var. of R. A. for 1 Day.	Apparent Declination	Var. of Decl. for 1 Day.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
Jan. 1	13 3 53.35	+4.287	−6 5 24.1	−24.43	18 18.6	July 3	12 49 34.73	+2.506	−4 36 47.8	−18.49	6 0.8
5	13 4 8.87	3.473	6 6 51.7	19.36	18 3.1	7	12 49 46.30	3.280	4 38 11.5	23.35	5 45 3
9	13 4 21.11	2.642	6 7 58.8	14.21	17 47.6	11	12 50 0.95	4.045	4 39 54.5	28.14	5 29.8
13	13 4 30.00	1.801	6 8 45.3	9.02	17 32.0	15	12 50 18.64	4.796	4 41 56.4	32.82	5 14.4
17	13 4 35.51	0.956	6 9 10.9	− 3.81	17 16.4	19	12 50 39.29	5.527	4 44 16.8	37.36	4 59.0
21	13 4 37.65	+0.114	−6 9 15.7	+ 1.37	17 0.6	23	12 51 2.83	+6.238	−4 46 55.2	−41.77	4 43.7
25	13 4 36.44	−0.718	6 9 0.0	6.48	16 44.9	27	12 51 29.17	6.929	4 49 50.8	46.03	4 28.4
29	13 4 31.92	1.538	6 8 24.0	11.49	16 29.1	31	12 51 58.24	7 601	4 53 3.3	50.15	4 13.2
Feb. 2	13 4 24.15	2.346	6 7 28.2	16.41	16 13.2	Aug. 4	12 52 29.95	8.252	4 56 31.9	54.13	3 58.0
6	13 4 13.18	3.137	6 6 12.8	21.23	15 57.3	8	12 53 4.22	8.878	5 0 16.1	57.93	3 42.8
10	13 3 59.08	−3.905	−6 4 38.5	+25.89	15 41.3	12	12 53 40.93	+9.472	−5 4 15.1	−61.53	3 27.7
14	13 3 41.97	4.642	6 2 45.9	30.37	15 25.3	16	12 54 19.96	10.033	5 8 28.1	64.90	3 12.6
18	13 3 21.99	5.342	6 0 35.9	34.59	15 9.3	20	12 55 1.15	10.560	5 12 54.0	68.04	2 57.6
22	13 2 59.30	5.997	5 58 9.5	38.56	14 53.1	24	12 55 44.40	11.056	5 17 32.1	70.97	2 42.6
26	13 2 34.08	6.607	5 55 27.8	42.23	14 37.0	28	12 56 29.56	11.521	5 22 21.5	73.68	2 27.6
Mar. 1	13 2 6.50	−7.173	−5 52 32.0	+45.62	14 20.8	Sept. 1	12 57 16.52	11.954	−5 27 21.3	−76.18	2 12.6
5	13 1 36.76	7.690	5 49 23.2	48.70	14 4.5	5	12 58 5.15	12.351	5 32 30.6	78.44	1 57.7
9	13 1 5.05	8.153	5 46 2.8	51.45	13 48.3	9	12 58 55.28	12.707	5 37 48.5	80.44	1 42.8
13	13 0 31.62	8.555	5 42 32.1	53.83	13 32.0	13	12 59 46.75	13.020	5 43 13.8	82.17	1 27.9
17	12 59 56.70	8.891	5 38 52.7	55.80	13 15.7	17	13 0 39.38	13.292	5 48 45.5	83.62	1 13.1
21	12 59 20.58	−9.160	−5 35 6.3	+57.35	12 59.4	21	13 1 33.03	13.526	−5 54 22.4	−84.83	0 58.2
25	12 58 43.51	9.364	5 31 14.5	58.49	12 43.1	25	13 2 27.54	13.722	6 0 3.7	85.78	0 43.4
29	12 58 5.75	9.504	5 27 19.0	59.22	12 26.7	29	13 3 22.76	13.878	6 5 48.3	86.48	0 28.6
Apr. 2	12 57 27.56	9.580	5 23 21.3	59.56	12 10.3	Oct. 3	13 4 18.51	13.992	6 11 35.2	86.92	0 13.8
6	12 56 49.19	9.591	5 19 23.1	59.49	11 54.0	7	13 5 14.63	14.059	6 17 23.3	87.07	23 55.3
10	12 56 10.92	−9.532	−5 15 26.0	+58.99	11 37.6	11	13 6 10.92	14.078	−6 23 11.4	−86.92	23 40.5
14	12 55 33.03	9.404	5 11 31.8	58.05	11 21.2	15	13 7 7.20	14.053	6 28 58.3	86.49	23 25.7
18	12 54 55.79	9.205	5 7 42.1	56.69	11 4.9	19	13 8 3.29	13.984	6 34 43.0	85.80	23 10.9
22	12 54 19.47	8.946	5 3 58.8	54.93	10 48.6	23	13 8 59.02	13.875	6 40 24.4	84.84	22 56.1
26	12 53 44.30	8.631	5 0 23.1	52.82	10 32.3	27	13 9 54.23	13.723	6 46 1.4	83.63	22 41.3
30	12 53 10.50	−8.261	−4 56 56.6	+50.37	10 16.0	31	13 10 48.74	13.524	−6 51 33.1	−82.16	22 26.5
May 4	12 52 38.28	7.837	4 53 40.6	47.59	9 59.7	Nov. 4	13 11 42.36	13.277	6 56 58.3	80.40	22 11.6
8	12 52 7.87	7.359	4 50 36.4	44.47	9 43.5	8	13 12 34.90	12.982	7 2 15.8	78.34	21 56.8
12	12 51 39.48	6.829	4 47 45.2	41.03	9 27.3	12	13 13 26.16	12.642	7 7 24.7	76.02	21 41.9
16	12 51 13.30	6.254	4 45 8.4	37.32	9 11.1	16	13 14 15.98	12.260	7 12 23.7	73.46	21 27.0
20	12 50 49.50	−5.640	−4 42 47.0	+33.36	8 55.0	20	13 15 4.18	11.837	−7 17 12.1	−70.68	21 12.0
24	12 50 28.22	4.995	4 40 41.8	29.19	8 39.0	24	13 15 50.62	11.375	7 21 48.8	67.65	20 57.1
28	12 50 9.57	4.324	4 38 53.6	24.86	8 22.9	28	13 16 35.13	10.869	7 26 13.0	64.40	20 42.1
June 1	12 49 53.68	3.621	4 37 23.1	20.37	8 6.9	Dec. 2	13 17 17.52	10.318	7 30 23.7	60.89	20 27.0
5	12 49 40.64	2.894	4 36 10.8	15.73	7 51.0	6	13 17 57.63	9.728	7 34 19.9	57.16	20 12.0
9	12 49 30.55	−2.145	−4 35 17.4	+10.95	7 35.1	10	13 18 35.30	+9.099	−7 38 0.7	−53.21	19 56.9
13	12 49 23.50	1.380	4 34 43.3	6.09	7 19.2	14	13 19 10.38	8.438	7 41 25.3	49.10	19 41.7
17	12 49 19.53	−0.605	4 34 28.8	+ 1.16	7 3.5	18	13 19 42.76	7.748	7 44 33.2	44.82	19 26.5
21	12 49 18.66	+0.172	4 34 34.0	− 3.77	6 47.8	22	13 20 12.33	7.029	7 47 23.7	40.39	19 11.3
25	12 49 20.90	0.950	4 34 59.0	8.70	6 32.1	26	13 20 38.96	6.281	7 49 56.2	35.82	18 56.0
29	12 49 26.26	+1.728	−4 35 43.6	−13.60	6 16.4	30	13 21 2.54	+5.503	−7 52 10.1	−31.10	18 40.6
July 3	12 49 34.73	+2.506	−4 36 47.8	−18.49	6 0.8	34	13 21 22.96	+4.702	−7 54 4.8	−26.25	18 25.2

Greatest horizontal parallax, April 7, 0″.51.
Least horizontal parallax, October 9, 0″.46.

Greatest semidiameter, April 7, 1″.93.
Least semidiameter, October 9, 1″.73.

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. of R. A. for 1 Day.	Apparent Declination.	Var. of Decl. for 1 Day.	Meridian Passage.	Date.	Apparent Right Ascension.	Var. of R. A. for 1 Day.	Apparent Declination	Var. of Decl. for 1 Day.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
Jan. 1	3 43 4.21	−4.718	+17 57 13.4	−12.64	8 59.2	July 3	3 58 6.86	+7.497	+18 49 48.4	+20.04	21 7.0
5	3 42 46.18	4.291	17 56 26.0	11.08	8 43.2	7	3 58 36.19	7.164	18 51 6.1	18.81	20 51.7
9	3 42 29.92	3.835	17 55 44.9	9.44	8 27.2	11	3 59 4.14	6.806	18 52 18.8	17.52	20 36.4
13	3 42 15.54	3.352	17 55 10.6	7.71	8 11.3	15	3 59 30.60	6.420	18 53 26.3	16.21	20 21.1
17	3 42 3.14	2.842	17 54 43.3	5.92	7 55.3	19	3 59 55.47	6.012	18 54 28.4	14.83	20 5.8
21	3 41 52.83	−2.314	+17 54 23.3	− 4.08	7 39.4	23	4 0 18.67	+5.586	+18 55 24.9	+13.42	19 50.5
25	3 41 44.64	1.777	17 54 10.7	2.20	7 23.6	27	4 0 40.13	5.141	18 56 15.7	11.98	19 35.1
29	3 41 38.63	1.228	17 54 5.7	− 0.30	7 7.8	31	4 0 59.77	4.676	18 57 0.7	10 51	19 19.7
Feb. 2	3 41 34.83	0 671	17 54 8.3	+ 1.59	6 52.0	Aug. 4	4 1 17.51	4.189	18 57 39.7	8.99	19 4.3
6	3 41 33.27	−0.107	17 54 18.4	3.48	6 36.2	8	4 1 33.26	3.684	18 58 12.6	7.45	18 48.8
10	3 41 33.98	+0.464	+17 54 36.2	+ 5.40	6 20.5	12	4 1 46.97	+3.168	+18 58 39.3	+ 5.90	18 33.3
14	3 41 36.98	1.034	17 55 1.6	7.31	6 4.8	16	4 1 58.59	2.641	18 58 59.8	4.32	18 17.8
18	3 41 42.25	1.602	17 55 34.6	9.17	5 49.2	20	4 2 8.09	2.106	18 59 13.9	2.75	18 2.2
22	3 41 49.79	2 163	17 56 14.9	10.97	5 33.6	24	4 2 15.43	1.565	18 59 21.8	+ 1.20	17 46.6
26	3 41 59.54	2.712	17 57 2.3	12.72	5 18.0	28	4 2 20.60	1.016	18 59 23.5	− 0.36	17 30.9
Mar. 1	3 42 11.47	+3.251	+17 57 56.6	+14.42	5 2.5	Sept. 1	4 2 23.55	+0.461	+18 59 18.9	− 1.93	17 15.2
5	3 42 25.53	3.778	17 58 57.6	16.06	4 47.0	5	4 2 24.29	−0.093	18 59 8.1	3.48	16 59.5
9	3 42 41.68	4.293	18 0 5.0	17.63	4 31.6	9	4 2 22.81	0.646	18 58 51.1	5.02	16 43.8
13	3 42 59.85	4.791	18 1 18.5	19.12	4 16.1	13	4 2 19.13	1.193	18 58 28.0	6.52	16 28.0
17	3 43 19.98	5.269	18 2 37 8	20.52	4 0.7	17	4 2 13.28	1.731	18 57 59.0	7 96	16 12.1
21	3 43 41.97	+5.722	+18 4 2.5	+21.80	3 45.4	21	4 2 5.30	−2.257	+18 57 24.4	− 9.36	15 56.3
25	3 44 5.73	6.151	18 5 32.1	23.00	3 30.0	25	4 1 55.24	2.768	18 56 44.2	10.72	15 40.4
29	3 44 31.15	6.557	18 7 6.4	24.12	3 14.7	29	4 1 43.17	3.268	18 55 58.7	12.02	15 24.4
Apr. 2	3 44 58.16	6.942	18 8 44.9	25.12	2 59.5	Oct. 3	4 1 29.12	3.750	18 55 8.1	13.27	15 8.5
6	3 45 26.65	7.299	18 10 27.2	26.02	2 44.2	7	4 1 13.20	4.207	18 54 12.6	14.45	14 52.5
10	3 45 56.52	+7.631	+18 12 12.9	+26.82	2 29.0	11	4 0 55.50	−4.637	+18 53 12.6	−15.54	14 36.5
14	3 46 27.66	7.932	18 14 1.6	27.51	2 13.8	15	4 0 36.14	5.039	18 52 8.4	16.54	14 20.4
18	3 46 59.94	8.204	18 15 52.8	28.07	1 58.6	19	4 0 15.23	5.408	18 51 0.4	17.44	14 4.3
22	3 47 33.25	8.444	18 17 46.0	28.52	1 43.4	23	3 59 52.92	5.745	18 49 49.0	18.26	13 48.2
26	3 48 7.45	8.652	18 19 40.8	28.87	1 28.2	27	3 59 29.31	6.051	18 48 34.5	18.96	13 32.1
30	3 48 42.43	+8.834	+18 21 36.8	+29.12	1 13.1	31	3 59 4.56	−6 320	+18 47 17.5	−19.54	13 16.0
May 4	3 49 18.08	8.985	18 23 33.6	29.26	0 57.9	Nov. 4	3 58 38.81	6.546	18 45 58.3	20.03	12 59.8
8	3 49 54.27	9.105	18 25 30.7	29.28	0 42.8	8	3 58 12.25	6.727	18 44 37.4	20.38	12 43.6
12	3 50 30.88	9.193	18 27 27.7	29.22	0 27.7	12	3 57 45.05	6.866	18 43 15.4	20.60	12 27.5
16	3 51 7.77	9.245	18 29 24.3	29.04	0 12.6	16	3 57 17.38	6.961	18 41 52.8	20.67	12 11.3
20	3 51 44.80	+9.268	+18 31 19.9	+28.75	23 53.7	20	3 56 49.42	−7.012	+18 40 30.2	−20.62	11 55.1
24	3 52 21.87	9.259	18 33 14.2	28.38	23 38.5	24	3 56 21.34	7.020	18 39 8.0	20.45	11 38.9
28	3 52 58.83	9.217	18 35 6.8	27.91	23 23.4	28	3 55 53.32	6.981	18 37 46.8	20.15	11 22.7
June 1	3 53 35.57	9.148	18 36 57.4	27.36	23 8.3	Dec. 2	3 55 25.55	6.896	18 36 27.0	19.70	11 6.5
5	3 54 11.97	9.048	18 38 45.6	26.73	22 53.2	6	3 54 58.21	6.765	18 35 9.4	19.10	10 50.3
9	3 54 47.91	+8.916	+18 40 31.1	+26.00	22 38.0	10	3 54 31.49	−6.587	+18 33 54.4	−18.37	10 34.2
13	3 55 23.25	8.750	18 42 13.5	25.19	22 22.9	14	3 54 5.57	6.367	18 32 42.6	17.52	10 18.0
17	3 55 57.87	8.553	18 43 52.5	24.29	22 7.7	18	3 53 40.61	6.106	18 31 34.4	16.55	10 1.9
21	3 56 31.64	8.329	18 45 27.7	23.31	21 52.6	22	3 53 16.77	5.807	18 30 30.4	15.44	9 45.8
25	3 57 4.47	8.081	18 46 58.9	22 28	21 37.4	26	3 52 54.20	5.472	18 29 31.0	14.25	9 29.6
29	3 57 36.25	+7.803	+18 48 25.9	+21.20	21 22.2	30	3 52 33.04	−5.101	+18 28 36.5	−12.96	9 13.6
July 3	3 58 6.86	+7.497	+18 49 48.4	+20.04	21 7.0	34	3 52 13.44	−4.693	+18 27 47.4	−11.55	8 57.5

Greatest horizontal parallax, November 22, 0″.31.
Least horizontal parallax, May 21, 0″.29.
Greatest semidiameter, November 22, 1″.33.
Least semidiameter, May 21, 1″.25.

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth— At Date.	Logarithm of Distance from Earth— At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Jan. 1	248 35 50.8	2 45 3.0	+ 8 50.1	−2 35 19.9	−18 48.8	9.6682079	0.1461082	0.1478254
3	254 5 23.0	2 44 37.5	10 27.6	3 12 6.2	17 56.8	9.6689999	0.1493694	0.1507429
5	259 34 53.6	2 45 1.2	11 41.8	3 47 4.2	17 0.5	9.6687518	0.1519481	0.1529865
7	265 6 0.4	2 46 13.7	12 30.6	4 20 4.1	15 58.8	9.6674624	0.1538591	0.1545665
9	270 40 21.5	2 48 15.8	12 51.5	4 50 54.4	14 50.6	9.6651289	0.1551088	0.1554853
11	276 19 38.1	2 51 9.5	+12 42.9	−5 19 21.5	−13 34 9	9.6617455	0.1556949	0.1557361
13	282 5 35.4	2 54 57.0	12 3.9	5 45 8.7	12 10.2	9.6573049	0.1556067	0.1553040
15	288 0 4.1	2 59 41.4	10 53.7	6 7 55.9	10 34.7	9.6517986	0.1548246	0.1541643
17	294 5 1.7	3 5 26.8	9 12.6	6 27 18.6	8 45.5	9.6452206	0.1533182	0.1522813
19	300 22 35.2	3 12 18.0	7 2.1	6 42 47.0	6 39.9	9.6375678	0.1510466	0.1496072
21	306 55 1.0	3 20 20.0	+ 4 25.2	−6 53 45.2	− 4 15.0	9.6288442	0.1479551	0.1460817
23	313 44 46.3	3 29 38.7	+ 1 27.2	6 59 30.6	− 1 26.4	9.6190667	0.1439764	0.1416285
25	320 54 30.7	3 40 19.8	− 1 44.5	6 59 12.8	+ 1 49.0	9.6082708	0.1390255	0.1361537
27	328 27 3.2	3 52 27.5	4 59.6	6 51 54.0	5 35.2	9.5965205	0.1329988	0.1295442
29	336 25 20.7	4 6 5.0	8 3.0	6 36 29.4	9 55.1	9.5839209	0.1257726	0.1216653
31	344 52 22.7	4 21 11.4	−10 37.0	−6 11 50.5	+14 49.5	9.5706337	0.1172022	0.1123621
Feb. 2	353 51 1.3	4 37 39.9	12 20.3	5 36 50.2	20 15.5	9.5568947	0.1071223	0.1014589
4	3 23 46.6	4 55 14.8	12 51.5	4 50 32.9	26 4.4	9.5430342	0.0953479	0.0887654
6	13 32 23.5	5 13 25.6	11 51.4	3 52 28.9	31 58.5	9 5294917	0.0816868	0.0740896
8	24 17 24.4	5 31 29.6	9 11.5	2 42 54.9	37 28.7	9.5168208	0.0659525	0.0572575
10	35 37 34.7	5 48 22.6	− 5 0.3	−1 23 16.3	+41 55.7	9.5056710	0.0479904	0.0381428
12	47 29 16.1	6 2 47.4	+ 0 13.1	+0 3 35.2	44 33.8	9.4967365	0.0277138	0.0167107
14	59 46 10.4	6 13 21.0	5 34.1	1 33 18.4	44 41.5	9.4906687	0.0051518	9.9930668
16	72 19 15.2	6 18 47.7	9 58.6	3 0 25.9	41 56.4	9.4879624	9.9804986	9.9675045
18	84 57 25.2	6 18 21.4	12 29.7	4 19 14.1	36 26.0	9.4888537	9.9541574	9.9405453
20	97 28 41.5	6 11 57.0	+12 37.5	+5 24 46.0	+28 49.1	9.4932637	9.9267710	9.9129532
22	109 41 42.3	6 0 17.1	10 28.4	6 13 45.0	20 4.0	9.5008179	9.8992222	9.8857206
24	121 27 9.0	5 44 36.4	6 37.6	6 44 56.8	11 11.4	9.5109302	9.8726000	9.8600165
26	132 38 27.2	5 26 24.6	+ 1 56.7	6 58 58.6	+ 3 0.2	9.5229149	9.8481272	9.8370852
28	143 12 5.4	5 7 9.8	− 2 45.3	6 57 44.9	− 4 0.8	9.5360912	9.8270337	9.8181010
Mar. 1	153 7 11.3	4 48 1.7	− 6 50.6	+6 43 49.2	− 9 41.3	9.5498524	9.8103945	9.8039952
3	162 24 48.9	4 29 48.1	9 57.3	6 19 52.5	14 2.9	9.5637007	9.7989550	9.7952953
5	171 7 20.3	4 12 59.2	11 56.1	5 48 23.8	17 15.2	9.5772522	9.7930062	9.7920486
7	179 17 51.8	3 57 49.3	12 48.5	5 11 30.1	19 29.9	9.5902252	9.7923578	9.7938483
9	186 59 46.6	3 44 22.8	12 41.0	4 30 54.6	20 58.9	9.6024228	9.7964205	9.7999645
11	194 16 30.6	3 32 37.7	−11 43.5	+3 47 58.1	−21 52.6	9.6137135	9.8043667	9.8095132
13	201 11 20.9	3 22 27.9	10 7.0	3 3 42.2	22 19.5	9.6240139	9.8152942	9.8216053
15	207 47 20.9	3 13 46.3	8 1.5	2 18 53.5	22 26.4	9.6332754	9.8283514	9.8354458
17	214 7 20.1	3 6 25.8	5 36.8	1 34 6.5	22 18.5	9.6414726	9.8428117	9.8503820
19	220 13 53.2	3 0 19.5	3 1.5	0 49 47.1	21 59.4	9.6485959	9.8580974	9.8659082
21	226 9 21.0	2 55 20.0	− 0 22.8	+0 6 14.4	−21 32.1	9.6546449	9.8737718	9.8816523
23	231 55 53.0	2 51 22.3	+ 2 12.7	−0 36 16.9	20 58.2	9.6596252	9.8895200	9.8973501
25	237 35 28.5	2 48 22.2	4 40.0	1 17 35.1	20 19.2	9.6635438	9.9051226	9.9128216
27	243 9 58.7	2 46 16.6	6 54.3	1 57 30.7	19 35.7	9.6664089	9.9204340	9.9279495
29	248 41 9.0	2 45 2.2	8 51.8	2 35 55.0	18 48.0	9.6682270	9.9353602	9.9426608
31	254 10 40.7	2 44 37.6	+10 29.0	−3 12 39.7	−17 56.0	9.6690028	9.9498463	9.9569140
33	259 40 12.1	2 45 1.8	+11 42.8	−3 47 35.9	−16 59.4	9.6687385	9.9638619	

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Apr. 0	254 10 40.7	2 44 37.6	+10 29.0	−3 12 39.7	−17 56.0	9.6690028	9.9498463	9.9569140
2	259 40 12.1	2 45 1.8	11 42.8	3 47 35.9	16 59.4	9.6687385	9.9638619	9.9706889
4	265 11 20.7	2 46 15.1	12 31.2	4 20 33.9	15 57.4	9.6674331	9.9773945	9.9839789
6	270 45 45.7	2 48 18.0	12 51.6	4 51 22.1	14 49.5	9.6650834	9.9904426	9.9967862
8	276 25 7.9	2 51 12.3	12 42.6	5 19 46.8	13 33.9	9.6616837	0.0030105	0.0091163
10	282 11 12.1	2 55 0.6	+12 3.0	−5 45 31.4	−12 9.0	9.6572265	0.0151046	0.0209757
12	288 5 49.3	2 59 46.2	10 52.3	6 8 15.5	10 33.2	9.6517039	0.0267301	0.0323685
14	294 10 57.7	3 5 32.7	9 10.8	6 27 34.9	8 43.7	9.6451095	0.0378904	0.0432954
16	300 28 43.9	3 12 24.8	6 59.8	6 42 59.4	6 37.8	9.6374403	0.0485821	0.0537491
18	307 1 24.5	3 20 28.1	4 22.7	6 53 53.1	4 12.4	9.6287006	0.0587943	0.0637148
20	313 51 27.4	3 29 48.0	+ 1 24.3	−6 59 33.3	− 1 23.4	9.6189072	0.0685067	0.0731655
22	321 1 31.6	3 40 30.3	− 1 47.6	6 59 9.4	+ 1 52.3	9.6080963	0.0776859	0.0820614
24	328 34 26.8	3 52 39.6	5 2.5	6 51 43.5	5 39.0	9.5963322	0.0862847	0.0903469
26	336 33 9.9	4 6 18.4	8 5.6	6 36 10.8	9 59.4	9.5837212	0.0942377	0.0979460
28	345 0 40.0	4 21 26.2	10 39.4	6 11 22.8	14 54.3	9.5704255	0.1014591	0.1047627
30	353 59 49.4	4 37 55.8	−12 21.5	−5 36 12.4	+20 20.8	9.5566825	0.1078413	0.1106777
May 2	3 33 7.4	4 55 31.1	12 51.3	4 49 44.2	26 10.0	9.5428238	0.1132531	0.1155478
4	13 42 18.2	5 13 42.6	11 49.8	3 51 29.2	32 3.8	9.5292909	0.1175404	0.1192086
6	24 27 52.4	5 31 46.5	9 8.1	2 41 45.0	37 33.2	9.5166389	0.1205297	0.1214809
8	35 48 33.4	5 48 37.2	− 4 55.2	−1 21 58.1	41 59.1	9.5055184	0.1220396	0.1221840
10	47 40 41.7	6 2 59.3	+ 0 18.1	+0 4 58.1	+44 35.1	9.4966238	0.1218942	0.1211524
12	59 57 54.9	6 13 28.2	5 38.7	1 34 41.4	44 40.4	9.4906048	0.1199443	0.1182585
14	72 31 9.0	6 18 49.8	10 2.0	3 1 43.8	41 55.2	9.4879531	0.1160889	0.1134333
16	85 9 17.7	6 18 17.8	12 31.0	4 20 21.6	36 20.0	9.4888997	0.1102947	0.1066802
18	97 40 21.3	6 11 48.2	12 36.6	5 25 39.4	28 41.3	9.4933615	0.1026020	0.0980761
20	109 53 0.1	6 0 3.6	+10 25.4	+6 14 22.0	+19 55.5	9.5009597	0.0931215	0.0877596
22	121 37 55.9	5 44 19.8	6 33.5	6 45 17.4	11 3.5	9.5111059	0.0820140	0.0759093
24	132 48 40.0	5 26 7.3	+ 1 52.2	6 59 4.1	+ 2 53.2	9.5231136	0.0694705	0.0627225
26	143 21 43.4	5 6 52.1	− 2 49.4	6 57 37.4	− 4 6.8	9.5363027	0.0556898	0.0483956
28	153 16 13.6	4 47 44.2	6 53.9	6 43 31.2	9 45.6	9.5500682	0.0408625	0.0331114
30	162 33 17.5	4 29 31.8	− 9 59.7	+6 19 26.5	−14 6.4	9.5639140	0.0251621	0.0170332
June 1	171 15 17.7	4 12 44.2	11 57.5	5 47 51.9	17 17.6	9.5774579	0.0087420	0.0003040
3	179 25 21.0	3 57 36.1	12 48.9	5 10 54.1	19 31.6	9.5904196	9.9917345	9.9830475
5	187 6 51.1	3 44 11.2	12 40.5	4 30 15.9	21 0.0	9.6026034	9.9742562	9.9653734
7	194 23 13.4	3 32 27.6	11 42.3	3 47 17.7	21 53.2	9.6138788	9.9564117	9.9473829
9	201 17 44.9	3 22 19.1	−10 5.3	+3 3 1.0	−22 19.7	9.6241631	9.9382997	9.9291745
11	207 53 28.7	3 13 38.9	7 59.3	2 18 12.1	22 26.4	9.6334079	9.9200202	9.9108506
13	214 13 14.5	3 6 19.7	5 34.4	1 33 25.4	22 18.3	9.6415884	9.9016803	9.8925249
15	220 19 36.5	3 0 14.0	2 59.1	0 49 6.4	21 59.1	9.6486949	9.8834016	9.8743293
17	226 14 55.3	2 55 15.5	− 0 20.5	+0 5 34.5	21 31.6	9.6547273	9.8653285	9.8564224
19	232 1 19.9	2 51 19.0	+ 2 15.0	−0 36 55.5	−20 57.6	9.6596910	9.8476364	9.8389979
21	237 40 49.7	2 48 20.0	4 42.2	1 18 12.6	20 18.6	9.6635933	9.8305376	9.8222891
23	243 15 16.1	2 46 15.1	6 56.3	1 58 6.9	19 35.0	9.6664423	9.8142893	9.8065781
25	248 46 24.4	2 45 1.5	8 53.4	2 36 29.7	18 47.2	9.6682445	9.7991981	9.7921954
27	254 15 55.3	2 44 37.6	10 30.3	3 13 12.8	17 55.2	9.6690046	9.7856190	9.7795192
29	259 45 27.4	2 45 2.7	+11 44.0	−3 48 7.4	−16 58.6	9.6687247	9.7739489	9.7689616
31	265 16 38.6	2 46 16.8	+12 31.8	−4 21 3.5	−15 56.6	9.6674033	9.7646105	

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth— At Date.	Logarithm of Distance from Earth— At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
July 1	265 16 38.6	2 46 16.8	+12 31.8	−4 21 3.5	−15 56.6	9.6674033	9.7646105	9.7609481
3	270 51 7.7	2 48 20.6	12 51.7	4 51 49.5	14 48.3	9.6650379	9.7580237	9.7558837
5	276 30 35.4	2 51 15.8	12 42.2	5 20 11.9	13 32.6	9.6616223	9.7545694	9.7541152
7	282 16 46.8	2 55 4.8	12 2.1	5 45 53.9	12 7.7	9.6571492	9.7545487	9.7558880
9	288 11 32.9	2 59 51.0	10 50.9	6 8 35.1	10 31.6	9.6516105	9.7581416	9.7613095
11	294 16 51.8	3 5 38.4	+ 9 8.8	−6 27 51.0	− 8 41.9	9.6449999	9.7653805	9.7703339
13	300 34 50.4	3 12 31.6	6 57.5	6 43 11.6	6 35.8	9.6373145	9.7761406	9.7827628
15	307 7 45.8	3 20 36.0	4 20.1	6 54 0.9	4 10.0	9.6285586	9.7901557	9.7982688
17	313 58 5.6	3 29 57.0	+ 1 21.4	6 59 35.8	− 1 20.8	9.6187496	9.8070468	9.8164315
19	321 8 29.0	3 40 40.6	− 1 50.6	6 59 5.9	+ 1 55.5	9.6079235	9.8263626	9.8367787
21	328 41 46.1	3 52 51.2	− 5 5.3	−6 51 33.1	+ 5 42.8	9.5961457	9.8476179	9.8588190
23	336 40 53.7	4 6 31.4	8 8.2	6 35 52.4	10 3.7	9.5835228	9.8703225	9.8820694
25	345 8 51.2	4 21 40.4	10 41.0	6 10 55.3	14 59.0	9.5702183	9.8940031	9.9060685
27	354 8 30.4	4 38 11.2	12 22.5	5 35 35.0	20 26.0	9.5564708	9.9182119	9.9303820
29	3 42 20.0	4 55 47.2	12 51.1	4 48 56.1	26 15.4	9.5426133	9.9425281	9.9546011
31	13 52 3.6	5 13 59.1	−11 48.0	−3 50 30.4	+32 9.2	9.5290892	9.9665531	9.9783371
Aug. 2	24 38 10.5	5 32 1.6	9 5.0	2 40 36.2	37 38.0	9.5164553	9.9899073	0.0012190
4	35 59 21.8	5 48 51.6	− 4 50.9	−1 20 41.3	42 2.4	9.5053633	0.0122288	0.0228956
6	47 51 55.6	6 3 10.3	+ 0 23.2	+0 6 19.7	44 36.4	9.4965079	0.0331805	0.0430473
8	60 9 27.0	6 13 35.6	5 43.3	1 36 3.1	44 39.0	9.4905371	0.0524631	0.0614000
10	72 42 51.6	6 18 52.2	+10 5.2	+3 3 0.2	+41 48.8	9.4879394	0.0698348	0.0777495
12	85 20 58.7	6 18 14.3	12 32.2	4 21 27.9	36 13.8	9.4889414	0.0851322	0.0919763
14	97 51 50.3	6 11 39.7	12 35.4	5 26 31.6	28 33.6	9.4934546	0.0982821	0.1040542
16	110 4 7.4	5 59 51.2	10 22.6	6 14 58.3	19 47.4	9.5010966	0.1093029	0.1140425
18	121 48 34.6	5 44 4.2	6 29.6	6 45 37.5	10 55.6	9.5112764	0.1182905	0.1220668
20	132 58 45.9	5 25 50.1	+ 1 47.8	+6 59 9.2	+ 2 46.2	9.5233070	0.1253936	0.1282943
22	143 31 14.3	5 6 34.6	− 2 53.5	6 57 29.8	− 4 12.5	9.5365090	0.1307921	0.1329104
24	153 25 10.0	4 47 27.3	6 57.2	6 43 13.3	9 50.5	9.5502791	0.1346721	0.1360992
26	162 41 41.1	4 29 16.0	10 2.0	6 19 0.6	14 9.8	9.5641230	0.1372125	0.1380316
28	171 23 11.0	4 12 29.8	11 58 9	5 47 20.2	17 20.1	9.5776599	0.1385744	0.1388577
30	179 32 46.9	3 57 23.2	−12 49.2	+5 10 18.3	−19 33.3	9.5906110	0.1388969	0.1387055
Sept. 1	187 13 52.9	3 44 0.0	12 39.9	4 29 37.3	21 1.0	9.6027820	0.1382966	0.1376810
3	194 29 54.3	3 32 17.8	11 41.2	3 46 37.5	21 53.8	9.6140428	0.1368685	0.1358680
5	201 24 7.5	3 22 10.7	10 3.5	3 2 19.9	22 20.0	9.6243115	0.1346873	0.1333330
7	207 59 35.9	3 13 31.8	7 57.3	2 17 30.7	22 26.4	9.6335404	0.1318110	0.1301257
9	214 19 8.5	3 6 13.6	− 5 32.2	+1 32 44.2	−22 18.0	9.6417048	0.1282814	0.1262814
11	220 25 19.4	3 0 8.9	2 56.6	0 48 25.9	21 58.7	9.6487951	0.1241281	0.1218235
13	226 20 29.0	2 55 11.5	− 0 17.9	+0 4 54.8	21 31.1	9.6548115	0.1193685	0.1167634
15	232 6 46.6	2 51 15.9	+ 2 17.5	−0 37 34.3	20 57.1	9.6597592	0.1140089	0.1111043
17	237 46 11.0	2 48 17.8	4 44.4	1 18 50.2	20 17.9	9.6636457	0.1080482	0.1048392
19	243 20 33.7	2 46 13.6	+ 6 58.2	−1 58 43.1	−19 34.2	9.6664791	0.1014752	0.0979537
21	248 51 39.5	2 45 0.6	8 55.0	2 37 4.4	18 46.4	9.6682657	0.0942713	0.0904250
23	254 21 9.4	2 44 37.4	10 31.6	3 13 45.9	17 54.3	9.6690103	0.0864104	0.0822233
25	259 50 42.0	2 45 3.3	11 44.9	3 48 38.7	16 57.6	9.6687147	0.0778585	0.0733111
27	265 21 55.4	2 46 18.2	12 32.3	4 21 32.9	15 55.4	9.6673778	0.0685754	0.0636451
29	270 56 28.0	2 48 22.8	+12 51.8	−4 52 16.8	−14 47.2	9.6649966	0.0585143	0.0531759
31	276 36 0.7	2 51 18.7	+12 41.8	−5 20 36.8	−13 31.4	9.6615652	0.0476229	

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth— At Date.	Logarithm of Distance from Earth— At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Oct. 1	276 36 0.7	2 51 18.7	+12 41.8	−5 20 36.8	−13 31.4	9.6615652	0.0476229	0.0418485
3	282 22 18.7	2 55 8.6	12 1.3	5 46 16.1	12 6.3	9.6570761	0.0358447	0.0296045
5	288 17 13.2	2 59 55.8	10 49.7	6 8 54.4	10 30.0	9.6515212	0.0231209	0.0163867
7	294 22 42.5	3 5 44.1	9 7.0	6 28 6.9	8 40.1	9.6448942	0.0093954	0.0021415
9	300 40 53.4	3 12 38.2	6 55.3	6 43 23.7	6 33.7	9.6371923	9.9946200	9.9868278
11	307 14 2.8	3 20 43.6	+ 4 17.5	−6 54 8.5	− 4 7.5	9.6284200	9.9787639	9.9704293
13	314 4 39.3	3 30 6.0	+ 1 18.5	6 59 38.2	− 1 18.0	9.6185946	9.9618294	9.9529735
15	321 15 21.9	3 40 50.8	− 1 53.6	6 59 2.4	+ 1 58.5	9.6077531	9.9438774	9.9345626
17	328 49 0.6	3 53 2.7	5 8.2	6 51 22.6	5 46.5	9.5959610	9.9250614	9.9154136
19	336 48 32.7	4 6 44.5	8 10.8	6 35 34.0	10 7.9	9.5833256	9.9056772	9.8959227
21	345 16 57.7	4 21 54.8	−10 43.0	−6 10 28.0	+15 3.8	9.5700116	9.8862398	9.8767388
23	354 17 6.6	4 38 26.8	12 23.5	5 34 57.7	20 31.2	9.5562587	9.8675535	9.8588408
25	3 51 28.3	4 56 3.7	12 50.5	4 48 8.3	26 20.8	9.5424018	9.8507819	9.8435767
27	14 1 45.3	5 14 15.9	11 46.3	3 49 31.8	32 14.4	9.5288859	9.8374403	9.8325910
29	24 48 25.4	5 32 17.8	9 1.8	2 39 27.6	37 42.7	9.5162695	9.8292374	9.8275615
31	36 10 7.8	5 49 6.3	− 4 46.3	−1 19 24.6	+42 5.8	9.5052057	9.8277037	9.8297438
Nov. 2	48 3 9.1	6 3 22.6	+ 0 28.1	+0 7 41.1	44 37.6	9.4963891	9.8336933	9.8394880
4	60 21 1.1	6 13 43.3	5 47.9	1 37 24.6	44 37.9	9.4904660	9.8469963	9.8560277
6	72 54 36.0	6 18 54.8	10 8.4	3 4 16.8	41 44.9	9.4879217	9.8663503	9.8777093
8	85 32 43.3	6 18 11.6	12 33.3	4 22 34.3	36 7.6	9.4889786	9.8898459	9.9025113
10	98 3 24.1	6 11 31.8	+12 34.5	+5 27 24.1	+28 26.0	9.4935430	9.9154788	9.9285489
12	110 15 21.2	5 59 38.7	10 19.6	6 15 34.7	19 39.0	9.5012287	9.9415547	9.9543605
14	121 59 20.9	5 43 49.0	6 25.4	6 45 57.5	10 47.7	9.5114422	9.9668605	9.9789754
16	133 8 59.8	5 25 33.2	+ 1 43.3	6 59 14.3	+ 2 39.2	9.5234962	9.9906490	0.0018441
18	143 40 53.8	5 6 17.3	− 2 57.5	6 57 21.9	− 4 18.4	9.5367118	0.0125385	0.0227227
20	153 34 15.3	4 47 10.3	− 7 0.6	+6 42 54.9	− 9 55.0	9.5504871	0.0323963	0.0415660
22	162 50 13.2	4 29 0.0	10 4.2	6 18 34.2	14 13.3	9.5643294	0.0502427	0.0584420
24	171 31 12.9	4 12 15.4	12 0.1	5 46 47.8	17 22.6	9.5778598	0.0661816	0.0734805
26	179 40 21.4	3 57 10.3	12 49.5	5 9 41.6	19 35 0	9.5908012	0.0803577	0.0868323
28	187 21 3.0	3 43 48.5	12 39.4	4 28 57.9	21 2.1	9.6029597	0.0929236	0.0986506
30	194 36 42.8	3 32 7.8	−11 39.8	+3 45 56.4	−21 54.4	9.6142065	0.1040308	0.1090811
Dec. 2	201 30 37.4	3 22 2.1	10 1.7	3 1 38.0	22 20.2	9.6244604	0.1138174	0.1182547
4	208 5 49.7	3 13 24.4	7 55.0	2 16 48.6	22 26.4	9.6336737	0.1224074	0.1262883
6	214 25 8.6	3 6 7.4	5 29.7	1 32 2.3	22 17.8	9.6418222	0.1299096	0.1332826
8	220 31 8.1	3 0 3.8	2 54.2	0 47 44.6	21 58.6	9.6488964	0.1364176	0.1393240
10	226 26 8.6	2 55 7.4	− 0 15.5	+0 4 14.4	−21 30.6	9.6548968	0.1420102	0.1444843
12	232 12 18.8	2 51 12.7	+ 2 19.8	−0 38 13.7	20 56.5	9.6598286	0.1467538	0.1488247
14	237 51 37.6	2 48 15.3	4 46.5	1 19 28.3	20 17.3	9.6636992	0.1507027	0.1523930
16	243 25 56.0	2 46 11.9	7 0.2	1 59 19.8	19 33.6	9.6665167	0.1539002	0.1552281
18	248 56 59.5	2 44 59.9	8 56.7	2 37 39.7	18 45.6	9.6682875	0.1563798	0.1573579
20	254 26 28.7	2 44 37.5	+10 32.9	−3 14 19.5	−17 53.5	9.6690163	0.1581650	0.1588021
22	259 56 2.1	2 45 4.1	11 45.7	3 49 10.5	16 56.7	9.6687048	0.1592706	0.1595710
24	265 27 17.7	2 46 19.7	12 32.8	4 22 2.7	15 54.6	9.6673519	0.1597029	0.1596664
26	271 1 54.0	2 48 25.1	12 51.8	4 52 44.5	14 46.1	9.6649546	0.1594597	0.1590816
28	276 41 32.2	2 51 21.9	12 41.4	5 21 2.0	13 30.1	9.6615068	0.1585295	0.1578009
30	282 27 57.4	2 55 12.6	+12 0.4	−5 46 38.7	−12 4.9	9.6570013	0.1568923	0.1557996
32	288 23 0.7	3 0 0.6	+10 48.2	−6 9 14.1	−10 28.4	9.6514296	0.1545181	

VENUS.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Jan. –3	155 58 30.8	1 37 28.6	+1 0.0	+3 20 42.4	+0 58.2	9.8566679	9.9423242	9.9495340
1	162 28 18.2	1 37 24.8	+0 20.2	3 23 17.5	+0 19.3	9.8568298	9.9565972	9.9635165
5	168 57 47.5	1 37 19.6	–0 20.7	3 23 16.4	–0 19.8	9.8570234	9.9702950	9.9769352
9	175 26 53.4	1 37 13.1	1 0.5	3 20 39.5	0 58.6	9.8572460	9.9834398	9.9898118
13	181 55 30.9	1 37 5.4	1 37.2	3 15 29.4	1 36.4	9.8574946	9.9960548	0.0021724
17	188 23 35.4	1 36 56.7	–2 8.9	+3 7 50.5	–2 12.8	9.8577663	0.0081686	0.0140474
21	194 51 3.2	1 36 47.1	2 34.0	2 57 49.3	2 47.4	9.8580572	0.0198123	0.0254669
25	201 17 51.3	1 36 36.9	2 51.3	2 45 34.1	3 19.8	9.8583639	0.0310145	0.0364577
29	207 43 57.4	1 36 26.2	3 0.0	2 31 14.9	3 49.4	9.8586823	0.0417983	0.0470380
Feb. 2	214 9 20.0	1 36 15.2	2 59.6	2 15 3.0	4 16.0	9.8590085	0.0521788	0.0572220
6	220 33 58.8	1 36 4.2	–2 50.3	+1 57 11.2	–4 39.3	9.8593382	0.0621687	0.0670209
10	226 57 54.1	1 35 53.5	2 32.5	1 37 53.5	4 59.0	9.8596675	0.0717804	0.0764489
14	233 21 7.1	1 35 43.2	2 7.2	1 17 24.5	5 14.9	9.8599921	0.0810288	0.0855230
18	239 43 40.0	1 35 33.6	1 35.7	0 55 59.8	5 26.9	9.8603081	0.0899339	0.0942636
22	246 5 35.4	1 35 24.5	0 59.5	0 33 55.5	5 34.7	9.8606117	0.0985145	0.1026885
26	252 26 56.6	1 35 16.3	–0 20.4	+0 11 28.0	–5 38.4	9.8608990	0.1067871	0.1108116
Mar. 1	258 47 47.5	1 35 9.3	+0 19.7	–0 11 6.3	5 38.0	9.8611667	0.1147622	0.1186402
5	265 8 12.5	1 35 3.4	0 58.8	0 33 30.8	5 33.5	9.8614114	0.1224459	0.1261798
9	271 28 16.0	1 34 58.6	1 34.9	0 55 29.3	5 25.0	9.8616302	0.1298428	0.1334351
13	277 48 2.7	1 34 54.9	2 6.3	1 16 46.0	5 12.7	9.8618206	0.1369585	0.1404137
17	284 7 37.1	1 34 52.4	+2 31.6	–1 37 5.6	–4 56.5	9.8619802	0.1438024	0.1471262
21	290 27 3.8	1 34 51.1	2 49.6	1 56 13.5	4 36 8	9.8621070	0.1503866	0.1535847
25	296 46 27.1	1 34 50.8	2 59.3	2 13 56.1	4 13.9	9.8621998	0.1567214	0.1597977
29	303 5 51 3	1 34 51.4	3 0.3	2 30 0.7	3 47.9	9.8622574	0.1628138	0.1657701
Apr. 2	309 25 20.2	1 34 53.0	2 52.5	2 44 15.6	3 19.2	9.8622789	0.1686663	0.1715023
6	315 44 57.0	1 34 55.5	+2 36.4	–2 56 30.8	–2 48.0	9.8622642	0.1742776	0.1769925
10	322 4 44.8	1 34 58.6	2 12.7	3 6 37.2	2 14.8	9.8622135	0.1796470	0.1822415
14	328 24 46.3	1 35 2.3	1 42.5	3 14 27.4	1 40.0	9.8621273	0.1847767	0.1872534
18	334 45 3.7	1 35 6.5	1 7.3	3 19 55.6	1 3.9	9.8620067	0.1896720	0.1920336
22	341 5 38.7	1 35 11.1	+0 28.8	3 22 57.6	–0 26.9	9.8618533	0.1943386	0.1965877
26	347 26 32.9	1 35 16.0	–0 11.1	–3 23 30.7	+0 10.4	9.8616687	0.1987810	0.2009186
30	353 47 47.6	1 35 21.3	0 50.5	3 21 34.3	0 47.8	9.8614550	0.2029999	0.2050246
May 4	0 9 23.8	1 35 26.8	1 27.5	3 17 9.3	1 24.6	9.8612148	0.2069922	0.2089019
8	6 31 22.4	1 35 32.5	2 0.3	3 10 18.5	2 0.6	9.8609512	0.2107532	0.2125460
12	12 53 43.9	1 35 38.3	2 27.1	3 1 6.4	2 35.2	9.8606672	0.2142806	0.2159567
16	19 16 29.1	1 35 44.3	–2 46.7	–2 49 39.2	+3 8.0	9.8603662	0.2175746	0.2191350
20	25 39 38.6	1 35 50.5	2 58.1	2 36 5.1	3 38.6	9.8600521	0.2206386	0.2220853
24	32 3 13.2	1 35 56.8	3 0.8	2 20 33.4	4 6.7	9.8597286	0.2234757	0.2248097
28	38 27 13.4	1 36 3.3	2 54.4	2 3 15.5	4 31.8	9.8593998	0.2260871	0.2273076
June 1	44 51 39.9	1 36 10.0	2 39.3	1 44 23.7	4 53.6	9.8590697	0.2284703	0.2295748
5	51 16 33.4	1 36 16.8	–2 16.2	–1 24 11.8	+5 11.8	9.8587424	0.2306202	0.2316059
9	57 41 54.6	1 36 23.8	1 46.3	1 2 54.7	5 26.1	9.8584223	0.2325318	0.2333978
13	64 7 44.1	1 36 30.9	1 11.0	0 40 48.4	5 36.4	9.8581132	0.2342040	0.2349504
17	70 34 2.2	1 36 38.1	–0 32.1	–0 18 9.4	5 42.4	9.8578190	0.2356378	0.2362667
21	77 0 49.2	1 36 45.3	+0 8.4	+0 4 45.2	5 44.1	9.8575437	0.2368372	0.2373499
25	83 28 4.8	1 36 52.4	+0 48.6	+0 27 37.9	+5 41.4	9.8572908	0.2378053	0.2382026
29	89 55 48.6	1 36 59.4	1 26.4	0 50 11.0	5 34.4	9.8570635	0.2385418	0.2388222
33	96 23 59.8	1 37 6.1	+1 59.8	+1 12 7.2	+5 23.0	9.8568647	0.2390436	

VENUS.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
July 3	96 23 59.8	1 37 6.1	+1 59.8	+1 12 7.2	+5 23.0	9.8568647	0.2390436	0.2392051
7	102 52 36.6	1 37 12.3	2 27.2	1 33 9.1	5 7.4	9.8566971	0.2393066	0.2393479
11	109 21 37.1	1 37 17.9	2 47.1	1 53 0.6	4 47.8	9.8565629	0.2393288	0.2392496
15	115 50 58.8	1 37 22.8	2 58.4	2 11 26.0	4 24.4	9.8564638	0.2391109	0.2389135
19	122 20 38.2	1 37 26.8	3 0.6	2 28 10.7	3 57.5	9.8564013	0.2386577	0.2383445
23	128 50 31.6	1 37 29.7	+2 53.6	+2 43 1.7	+3 27.5	9.8563761	0.2379743	0.2375472
27	135 20 34.6	1 37 31.5	2 37.7	2 55 47.0	2 54.8	9.8563885	0.2370633	0.2365228
31	141 50 42.3	1 37 32.1	2 13.7	3 6 16.8	2 19.8	9.8564383	0.2359253	0.2352703
Aug. 4	148 20 49.5	1 37 31.3	1 42.8	3 14 23.0	1 43.0	9.8565251	0.2345578	0.2337873
8	154 50 50.7	1 37 29.1	1 6.8	3 19 59.4	1 5.0	9.8566475	0.2329589	0.2320724
12	161 20 40.3	1 37 25.5	+0 27.3	+3 23 1.7	+0 26.1	9.8568037	0.2311286	0.2301281
16	167 50 12.7	1 37 20.5	−0 13.6	3 23 27.9	−0 13.0	9.8569920	0.2290713	0.2279593
20	174 19 22.6	1 37 14.2	0 53.7	3 21 18.1	0 51.8	9.8572097	0.2267928	0.2255723
24	180 48 4.9	1 37 6.7	1 31.1	3 16 34.4	1 29.8	9.8574541	0.2242986	0.2229715
28	187 16 15.1	1 36 58.2	2 3.8	3 9 21.1	2 6.6	9.8577218	0.2215911	0.2201570
Sept. 1	193 43 49.2	1 36 48.7	−2 30.2	+2 59 44.3	−2 41.5	9.8580096	0.2186693	0.2171273
5	200 10 44.0	1 36 38.5	2 48.9	2 47 51.8	3 14.3	9.8583137	0.2155308	0.2138794
9	206 36 57.0	1 36 27.9	2 59.1	2 33 53.5	3 44.4	9.8586301	0.2121735	0.2104135
13	213 2 27.0	1 36 17.0	3 0.4	2 18 0.5	4 11.6	9.8589549	0.2085998	0.2067328
17	219 27 13.1	1 36 6.1	2 52.6	2 0 25.2	4 35.5	9.8592810	0.2048132	0.2028417
21	225 51 15.5	1 35 55.2	−2 36.2	+1 41 21.4	−4 55.8	9.8596134	0.2008192	0.1987455
25	232 14 35.5	1 35 44.9	2 12.1	1 21 3.8	5 12.4	9.8599388	0.1966205	0.1944445
29	238 37 15.0	1 35 35.0	1 41.6	0 59 47.7	5 25.0	9.8602563	0.1922168	0.1899365
Oct. 3	244 59 16 5	1 35 25.9	1 6.1	0 37 49.2	5 33.6	9.8605619	0.1876029	0.1852155
7	251 20 43.3	1 35 17.6	−0 27.3	+0 15 24.6	5 38.0	9.8608519	0.1827738	0.1802774
11	257 41 39.2	1 35 10.4	+0 12.7	−0 7 9.7	−5 38.4	9.8611228	0.1777263	0.1751205
15	264 2 8.3	1 35 4.3	0 52.1	0 29 37.1	5 34.6	9.8613714	0.1724603	0.1697459
19	270 22 15.2	1 34 59.3	1 28.9	0 51 41.3	5 26.8	9.8615945	0.1669776	0.1641557
23	276 42 4.4	1 34 55.5	2 1.3	1 13 6.4	5 15.1	9.8617897	0.1612798	0.1583495
27	283 1 40.7	1 34 52.8	2 27.7	1 33 37.1	4 59.6	9.8619545	0.1553641	0.1523224
31	289 21 8.5	1 34 51.2	+2 47.0	−1 52 58.6	−4 40.6	9.8620870	0.1492232	0 1460652
Nov. 4	295 40 32.2	1 34 50.8	2 58.2	2 10 57.0	4 18.2	9.8621856	0.1428472	0.1395680
8	301 59 56.0	1 34 51.3	3 0.8	2 27 19.6	3 52.7	9.8622492	0.1362265	0.1328220
12	308 19 23.8	1 34 52.7	2 54.5	2 41 54.5	3 24.4	9.8622768	0.1293540	0.1258220
16	314 38 59.1	1 34 55.0	2 39.8	2 54 31.3	2 53.6	9.8622684	0.1222259	0.1185654
20	320 58 44.9	1 34 58.0	+2 17.3	−3 5 0.8	−2 20.8	9.8622239	0.1148398	0.1110480
24	327 18 43.9	1 35 1.6	1 48.2	3 13 15.3	1 46.2	9.8621439	0.1071892	0.1032619
28	333 38 58.4	1 35 5.7	1 13.7	3 19 8.7	1 10.3	9.8620291	0.0992641	0.0951936
Dec. 2	339 59 30.3	1 35 10.3	+0 35.7	3 22 36.5	−0 33.5	9.8618811	0.0910483	0.0868259
6	346 20 21.2	1 35 15.2	−0 4.1	3 23 35.8	+0 3.8	9.8617016	0.0825246	0.0781419
10	352 41 32.4	1 35 20.4	−0 43.8	−3 22 5.5	+0 41.2	9.8614927	0.0736764	0.0691268
14	359 3 4.8	1 35 25.8	1 21.3	3 18 6 3	1 18.2	9.8612569	0.0644913	0.0597694
18	5 24 59.5	1 35 31.4	1 54.9	3 11 40.7	1 54.4	9.8609968	0.0549594	0.0500599
22	11 47 17.1	1 35 37.3	2 22.9	3 2 52.8	2 29.3	9.8607160	0.0450692	0.0399849
26	18 9 58.3	1 35 43.3	2 43.9	2 51 48.8	3 2.4	9.8604176	0.0348046	0.0295249
30	24 33 3.7	1 35 49.5	−2 56.8	−2 38 36.2	+3 33.5	9.8601052	0.0241424	0.0186535
34	30 56 31.0	1 35 55.7	−3 0.9	−2 23 24.3	+4 2.0	9.8597828	0.0130548	

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							At Date.	At Intermediate Date.
	° ′ ″	′ ″	″	° ′ ″	″			
Jan. 1	156 44 17.1	26 12.56	−31.8	+1 45 33.8	−15.73	0.2215819	0.1414228	0.1350797
5	158 29 8.4	26 13.14	34.3	1 44 27.9	17.20	0.2214966	0.1286296	0.1220714
9	160 14 2.6	26 14.01	36.8	1 43 16.2	18.65	0.2213701	0.1154042	0.1086287
13	161 59 1.0	26 15.21	39.1	1 41 58 7	20.10	0.2212020	0.1017450	0.0947547
17	163 44 4.8	26 16.72	41.3	1 40 35.4	21.55	0.2209927	0.0876581	0.0804574
21	165 29 15.2	26 18.50	−43.4	+1 39 6.3	−22.96	0.2207421	0.0731537	0.0657474
25	167 14 33.2	26 20.59	45.3	1 37 31.6	24.39	0.2204505	0.0582398	0.0506320
29	169 0 0.3	26 22.97	47.0	1 35 51.2	25.78	0.2201178	0.0429247	0.0351192
Feb. 2	170 45 37.4	26 25.64	48.4	1 34 5.3	27.16	0.2197442	0 0272175	0.0192217
6	172 31 25.8	26 28.61	49.8	1 32 13.8	28.55	0.2193300	0.0111363	0.0029665
10	174 17 26.7	26 31.91	−50.9	+1 30 16.9	−29.91	0.2188753	9.9947178	9.9863975
14	176 3 41.5	26 35.51	52.0	1 28 14.5	31.27	0.2183804	9.9780135	9.9695750
18	177 50 11.2	26 39.35	52.9	1 26 6.7	32.60	0.2178457	9.9610918	9.9525732
22	179 36 56.7	26 43.51	53.4	1 23 53.7	33.92	0.2172710	9.9440297	9.9354734
26	181 23 59.7	26 48.02	53.7	1 21 35.4	35.21	0.2166572	9.9269160	9.9183715
Mar. 1	183 11 21.3	26 52.81	−53.9	+1 19 12.0	−36.50	0.2160041	9.9098558	9.9013865
5	184 59 2.6	26 57.91	53.9	1 16 43.4	37.77	0.2153125	9.8929839	9.8846697
9	186 47 5.0	27 3.34	53.6	1 14 9.8	39.00	0.2145823	9.8764701	9.8684111
13	188 35 29.7	27 9.02	53.1	1 11 31.4	40.23	0.2138142	9.8605233	9.8528355
17	190 24 17.6	27 15.02	52.4	1 8 48.0	41.45	0.2130086	9.8453785	9.8381848
21	192 13 30.3	27 21.36	−51.5	+1 5 59.8	−42.63	0.2121660	9.8312850	9.8247112
25	194 3 8.9	27 27.96	50.4	1 3 7.0	43.79	0.2112869	9.8184945	9.8126659
29	195 53 14.4	27 34.86	49.1	1 0 9.5	44.92	0.2103715	9.8072566	9.8022977
Apr. 2	197 43 48.2	27 42.07	47.6	0 57 7.6	46.02	0.2094210	9.7978183	9.7938471
6	199 34 51.4	27 49.56	45.9	0 54 1.3	47.11	0.2084357	9.7904096	9.7875269
10	201 26 25.1	27 57.35	−43.9	+0 50 50.7	−48.16	0.2074162	9.7852174	9.7834926
14	203 18 30.8	28 5.45	41.8	0 47 36.0	49.17	0.2063632	9.7823591	9.7818157
18	205 11 9.4	28 13.90	39.4	0 44 17.3	50.16	0.2052774	9.7818560	9.7824700
22	207 4 22.2	28 22.62	37.0	0 40 54.7	51.13	0.2041599	9.7836408	9.7853482
26	208 58 10.5	28 31.61	34.2	0 37 28.3	52.04	0.2030111	9.7875702	9.7902815
30	210 52 35.5	28 40.90	−31.4	+0 33 58.4	−52.91	0.2018324	9.7934570	9.7970669
May 4	212 47 38.1	28 50.44	28.4	0 30 25.0	53.76	0.2006242	9.8010823	9.8054725
8	214 43 19.4	29 0.30	25.2	0 26 48.3	54.55	0.1993875	9.8102060	9.8152500
12	216 39 40.9	29 10.46	21.9	0 23 8.6	55.29	0.1981238	9.8205720	9.8261385
16	218 36 43.5	29 20.86	18.5	0 19 26.0	56.00	0.1968338	9.8319179	9.8378808
20	220 34 28.2	29 31.56	−15.0	+0 15 40.6	−56.65	0.1955192	9.8439978	9.8502427
24	222 32 56.3	29 42.50	11.5	0 11 52.8	57.25	0.1941807	9.8565918	9.8630248
28	224 32 8.5	29 53.67	7.8	0 8 2.6	57.79	0.1928197	9.8695234	9.8760696
June 1	226 32 6.0	30 5.09	4.1	0 4 10.5	58 26	0.1914373	9.8826508	9.8892516
5	228 32 49.5	30 16.79	− 0.3	+0 0 16.5	58.69	0.1900352	9.8958587	9.9024598
9	230 34 20.6	30 28.75	+ 3.5	−0 3 39.0	−59.03	0.1886148	9.9090440	9.9155997
13	232 36 39.8	30 40.89	7.4	0 7 35.7	59.31	0.1871778	9.9221171	9.9285878
17	234 39 48.0	30 53.24	11.2	0 11 33.5	59.54	0.1857257	9.9350041	9.9413600
21	236 43 46.0	31 5.77	14.9	0 15 32.0	59.67	0.1842601	9.9476503	9.9538723
25	238 48 34.5	31 18.54	18.7	0 19 30.9	59.72	0.1827827	9.9600231	9.9661009
29	240 54 14.6	31 31.51	+22.3	−0 23 29.8	−59.70	0.1812955	9.9721048	9.9780338
July 3	243 0 46.8	31 44.59	+25.8	−0 27 28.5	−59.60	0.1798003	9.9838864	9.9896614

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	° ′ ″	′ ″	″	° ′ ″	″			
July 3	243 0 46.8	31 44.59	+25.8	−0 27 28.5	−59.60	0.1798003	9.9838864	9.9896614
7	245 8 11.5	31 57.84	29.3	0 31 26.6	59.40	0.1782987	9.9953573	0.0009729
11	247 16 29.7	32 11.22	32.6	0 35 23.7	59.11	0.1767934	0.0065061	0.0119561
15	249 25 41.5	32 24.72	35.7	0 39 19.5	58.74	0.1752860	0.0173226	0.0226051
19	251 35 47.7	32 38.34	38.7	0 43 13.6	58.25	0.1737790	0 0278039	0.0329209
23	253 46 48.3	32 52.01	+41.4	−0 47 5.5	−57.67	0.1722746	0.0379581	0.0429156
27	255 58 43.9	33 5.76	43.9	0 50 54.9	56.99	0.1707748	0.0477970	0.0526035
31	258 11 34.4	33 19.52	46.3	0 54 41.4	56.20	0.1692822	0.0573361	0.0619967
Aug. 4	260 25 20.1	33 33.29	48.2	0 58 24.5	55.29	0.1677991	0.0665858	0.0711036
8	262 40 0.7	33 47.04	50.0	1 2 3.7	54.26	0.1663280	0.0755513	0.0799286
12	264 55 36.4	34 0.74	+51.4	−1 5 38.6	−53.12	0.1648716	0.0842359	0.0884745
16	267 12 6.6	34 14 39	52.6	1 9 8.7	51.89	0.1634323	0.0926462	0.0967523
20	269 29 31.4	34 27.94	53.4	1 12 33.7	50.54	0.1620130	0.1007947	0.1047759
24	271 47 50.0	34 41.37	53.8	1 15 53.0	49.05	0.1606160	0.1086980	0.1125625
28	274 7 2.3	34 54.65	53.9	1 19 6.1	47.44	0.1592442	0.1163717	0.1201281
Sept. 1	276 27 7.1	35 7.71	+53.7	−1 22 12.5	−45.72	0.1579001	0.1238317	0.1274831
5	278 48 3.8	35 20 60	53.1	1 25 11.9	43.90	0.1565863	0.1310832	0.1346328
9	281 9 51.7	35 33.27	52.1	1 28 3.7	41.94	0.1553061	0.1381323	0.1415824
13	283 32 29.7	35 45.61	50.7	1 30 47.4	39.86	0.1540617	0.1449844	0.1483398
17	285 55 56.3	35 57.59	49.0	1 33 22.6	37.67	0.1528562	0.1516500	0.1549174
21	288 20 10.1	36 9.26	+47.0	−1 35 48.8	−35.36	0.1516920	0.1581434	0.1613304
25	290 45 10.0	36 20.60	44.6	1 38 5.5	32.95	0.1505717	0.1644794	0.1675919
29	293 10 54.4	36 31.51	41.9	1 40 12.4	30.45	0.1494981	0.1706700	0.1737136
Oct. 3	295 37 21.5	36 41.96	38.9	1 42 9.1	27.84	0.1484736	0.1767227	0.1796985
7	298 4 29.4	36 51.90	35.5	1 43 55.1	25.12	0.1475006	0.1826409	0.1855510
11	300 32 16.0	37 1.34	+31.9	−1 45 30.1	−22.32	0.1465816	0.1884286	0.1912750
15	303 0 39.4	37 10.24	28.0	1 46 53.7	19.44	0.1457188	0.1940917	0.1968797
19	305 29 37.1	37 18.56	24.0	1 48 5.6	16.49	0.1449145	0.1996417	0.2023781
23	307 59 7.0	37 26.27	19.7	1 49 5.6	13.46	0.1441707	0.2050903	0.2077798
27	310 29 6.4	37 33.32	15.2	1 49 53.3	10.37	0.1434892	0.2104478	0.2130942
31	312 59 32.7	37 39.79	+10.7	−1 50 28.6	− 7.24	0.1428719	0.2157196	0.2183240
Nov. 4	315 30 23.8	37 45.59	5.9	1 50 51.2	4.05	0.1423206	0.2209078	0.2234707
8	318 1 36.5	37 50.65	+ 1.3	1 51 1.0	− 0.85	0.1418367	0.2260131	0.2285357
12	320 33 8.0	37 54.99	− 3.5	1 50 58.0	+ 2.37	0.1414215	0.2310388	0.2335234
16	323 4 55.4	37 58.57	8.2	1 50 42.0	5.62	0.1410758	0.2359913	0.2384430
20	325 36 55.6	38 1.42	−12.9	−1 50 13.0	+ 8.87	0.1408011	0.2408801	0.2433027
24	328 9 5.8	38 3.54	17.4	1 49 31.0	12.11	0.1405979	0.2457119	0.2481080
28	330 41 22.9	38 4.90	21.9	1 48 36.1	15.33	0.1404667	0.2504916	0.2528614
Dec. 2	333 13 43.9	38 5.47	26.1	1 47 28.4	18.51	0.1404080	0.2552180	0.2575611
6	335 46 5.6	38 5.24	30.3	1 46 8.0	21.65	0.1404217	0.2598903	0.2622059
10	338 18 24.7	38 4.29	−34.0	−1 44 35.2	+24.74	0.1405081	0.2645075	0.2667965
14	340 50 38.8	38 2.56	37.7	1 42 50.1	27.76	0.1406669	0.2690729	0.2713380
18	343 22 44.2	38 0.04	40.9	1 40 53.1	30.72	0.1408976	0.2735918	0.2758357
22	345 54 38.1	37 56.80	43.8	1 38 44.3	33.60	0.1411997	0.2780694	0.2802935
26	348 26 17.6	37 52.80	46.5	1 36 24.3	36.38	0.1415720	0.2825078	0.2847117
30	350 57 39.5	37 48.03	−48.6	−1 33 53.3	+39.08	0.1420136	0.2869051	0.2890873
34	353 28 40.9	37 42.56	−50.5	−1 31 11.7	+41.65	0.1425234		

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	° ′ ″	′ ″	″	° ′ ″	″			
Jan. 1	230 29 52.2	4 37.64	−26.9	+0 59 4.6	−4.18	0.7322535	0.7836238	0.7819908
5	230 48 23.0	4 37.73	27.0	0 58 47.8	4.21	0.7321802	0.7803043	0.7785646
9	231 6 54.1	4 37.82	27.0	0 58 30.9	4.24	0.7321065	0.7767726	0.7749288
13	231 25 25.6	4 37.92	27.0	0 58 13.9	4.26	0.7320322	0.7730342	0.7710893
17	231 43 57.5	4 38.01	27.0	0 57 56.8	4.29	0.7319574	0.7690956	0.7670542
21	232 2 29.8	4 38.11	−27.0	+0 57 39.6	−4.31	0.7318820	0.7649663	0.7628330
25	232 21 2.4	4 38.20	27.1	0 57 22.3	4.34	0.7318062	0.7606554	0.7584347
29	232 39 35.5	4 38.30	27.1	0 57 4.9	4.37	0.7317299	0.7561721	0.7538687
Feb. 2	232 58 8.9	4 38.40	27.1	0 56 47.4	4.40	0.7316530	0.7515257	0.7491444
6	233 16 42.7	4 38.50	27.1	0 56 29.7	4.42	0.7315756	0.7467262	0.7442724
10	233 35 16.9	4 38.60	−27.1	+0 56 12.0	−4.45	0.7314978	0.7417852	0.7392663
14	233 53 51.5	4 38.70	27.1	0 55 54.1	4.47	0.7314194	0.7367179	0.7341422
18	234 12 26.5	4 38.80	27.1	0 55 36.2	4.50	0.7313406	0.7315415	0.7289182
22	234 31 1.9	4 38.90	27.1	0 55 18.1	4.53	0.7312613	0.7262745	0.7236123
26	234 49 37.7	4 39.01	27.1	0 55 0.0	4.55	0.7311814	0.7209342	0.7182426
Mar. 1	235 8 13.9	4 39.11	−27.1	+0 54 41.7	−4.58	0.7311011	0.7155401	0.7128290
5	235 26 50.6	4 39.21	27.1	0 54 23.4	4.60	0.7310203	0.7101123	0.7073925
9	235 45 27.6	4 39.31	27.1	0 54 4.9	4.63	0.7309389	0.7046731	0.7019575
13	236 4 5.0	4 39.41	27.1	0 53 46.3	4.65	0.7308571	0.6992492	0.6965515
17	236 22 42.9	4 39.52	27.1	0 53 27.7	4.67	0.7307748	0.6938689	0.6912044
21	236 41 21.2	4 39.62	−27.0	+0 53 8.9	−4.70	0.7306919	0.6885619	0.6859450
25	236 59 59.9	4 39.73	27.0	0 52 50.0	4.73	0.7306086	0.6833574	0.6808028
29	237 18 39.0	4 39.84	27.0	0 52 31.0	4.76	0.7305249	0.6782849	0.6758074
Apr. 2	237 37 18.6	4 39.95	26.9	0 52 12.0	4.78	0.7304406	0.6733744	0.6709899
6	237 55 58.6	4 40.05	26.9	0 51 52.8	4.81	0.7303559	0.6686583	0.6663840
10	238 14 39.0	4 40.16	−26.9	+0 51 33.5	−4.83	0.7302707	0.6641713	0.6620248
14	238 33 19.9	4 40.27	26.8	0 51 14.1	4.85	0.7301850	0.6599485	0.6579469
18	238 52 1.2	4 40.38	26.8	0 50 54.7	4.88	0.7300989	0.6560237	0.6541827
22	239 10 42.9	4 40.49	26.7	0 50 35.1	4.91	0.7300123	0.6524273	0.6507612
26	239 29 25.1	4 40.60	26.7	0 50 15.4	4.93	0.7299253	0.6491876	0.6477099
30	239 48 7.7	4 40.71	−26.6	+0 49 55.7	−4.95	0.7298378	0.6463311	0.6450541
May 4	240 6 50.8	4 40.83	26.6	0 49 35.8	4.98	0.7297498	0.6438821	0.6428184
8	240 25 34.4	4 40.94	26.5	0 49 15.8	5.00	0.7296614	0.6418652	0.6410252
12	240 44 18.4	4 41.06	26.4	0 48 55.8	5.02	0.7295726	0.6402999	0.6396916
16	241 3 2.8	4 41.17	26.4	0 48 35.6	5.05	0.7291833	0.6392010	0.6388294
20	241 21 47.7	4 41.29	−26 3	+0 48 15.4	−5.07	0.7293935	0.6385766	0.6384432
24	241 40 33.1	4 41.40	26.2	0 47 55.1	5.11	0.7293033	0.6384288	0.6385334
28	241 59 19.0	4 41.52	26.2	0 47 34.6	5.12	0.7292127	0.6387562	0.6390964
June 1	242 18 5.3	4 41.63	26.1	0 47 14.1	5.14	0.7291216	0 6395532	0.6401261
5	242 36 52.0	4 41.75	26.0	0 46 53.5	5.17	0.7290301	0.6408131	0.6416130
9	242 55 39.3	4 41.87	−25.9	+0 46 32.8	−5.19	0.7289381	0.6425231	0.6435411
13	243 14 27.0	4 41.99	25.8	0 46 12.0	5.21	0.7288457	0.6446641	0.6458894
17	243 33 15.2	4 42.11	25.7	0 45 51.1	5.24	0.7287529	0.6472134	0.6486327
21	243 52 3.9	4 42.23	25.6	0 45 30.1	5.26	0.7286596	0.6501436	0.6517426
25	244 10 53.1	4 42.36	25.5	0 45 9.0	5.28	0.7285659	0.6534261	0.6551903
29	244 29 42.8	4 42.48	−25.4	+0 44 47.8	−5.30	0.7284718	0.6570321	0.6589475
July 3	244 48 32.9	4 42.60	−25.3	+0 44 26.6	−5.33	0.7283772	0.6609328	0.6629845

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July 3	244 48 32.9	4 42.60	−25.3	+0 44 26.6	−5.33	0.7283772	0.6609328	0.6629845
7	245 7 23.5	4 42.72	25.2	0 44 5.2	5.35	0.7282822	0.6650984	0.6672705
11	245 26 14.7	4 42.84	25.1	0 43 43.8	5 37	0.7281868	0.6694964	0.6717718
15	245 45 6.3	4 42.97	25.0	0 43 22.3	5.39	0.7280909	0.6740927	0.6764548
19	246 3 58.4	4 43.09	24.9	0 43 0.6	5.41	0.7279946	0.6788544	0.6812874
23	246 22 51.0	4 43.22	−24.8	+0 42 38.9	−5.44	0.7278979	0.6837504	0.6862396
27	246 41 44.1	4 43.35	24.6	0 42 17.2	5.46	0.7278008	0.6887518	0.6912839
31	247 0 37.8	4 43.47	24.5	0 41 55.3	5.48	0.7277033	0.6938326	0.6963946
Aug. 4	247 19 31.9	4 43.60	24.4	0 41 33.3	5.50	0.7276054	0.6989668	0.7015458
8	247 38 26.6	4 43.72	24.2	0 41 11.3	5.52	0.7275071	0.7041285	0.7067115
12	247 57 21.7	4 43.85	−24.1	+0 40 49.2	−5.54	0.7274083	0.7092921	0.7118671
16	248 16 17.4	4 43.98	24.0	0 40 27.0	5.56	0.7273092	0.7144340	0.7169901
20	248 35 13.5	4 44.11	23.8	0 40 4.7	5.58	0.7272096	0.7195332	0.7220611
24	248 54 10.2	4 44.24	23.7	0 39 42.3	5.61	0.7271097	0.7245718	0.7270632
28	249 13 7.5	4 44.37	23.5	0 39 19.8	5.63	0.7270093	0.7295336	0.7319811
Sept. 1	249 32 5.2	4 44.50	−23.4	+0 38 57.3	−5.65	0.7269086	0.7344037	0.7367994
5	249 51 3.5	4 44.63	23.2	0 38 34.6	5.67	0.7268075	0.7391662	0.7415023
9	250 10 2.3	4 44.77	23.1	0 38 11.9	5.69	0.7267060	0.7438060	0.7460755
13	250 29 1.6	4 44.90	22.9	0 37 49.1	5.71	0.7266041	0.7483094	0.7505062
17	250 48 1.5	4 45.03	22.7	0 37 26.3	5.73	0.7265019	0.7526648	0.7547841
21	251 7 1.9	4 45.16	−22.6	+0 37 3.3	−5.75	0.7263992	0.7568631	0.7589009
25	251 26 2.8	4 45.30	22.4	0 36 40.3	5.77	0.7262962	0.7608965	0.7628490
29	251 45 4.3	4 45.43	22.3	0 36 17.2	5.79	0.7261928	0.7647572	0.7666200
Oct. 3	252 4 6.3	4 45.57	22.1	0 35 54.0	5.81	0.7260890	0.7684365	0.7702055
7	252 23 8.8	4 45.71	21.9	0 35 30.8	5.82	0.7259848	0.7719260	0.7735970
11	252 42 11.9	4 45.84	−21.7	+0 35 7.4	−5.84	0.7258802	0.7752180	0.7767881
15	253 1 15.6	4 45.98	21.5	0 34 44.0	5.86	0.7257753	0.7783071	0.7797743
19	253 20 19.8	4 46.12	21.4	0 34 20.6	5.88	0.7256701	0.7811892	0.7825514
23	253 39 24.6	4 46.26	21.2	0 33 57.0	5.90	0.7255645	0.7838605	0.7851162
27	253 58 29.9	4 46.40	21.0	0 33 33.4	5.92	0.7254585	0.7863178	0.7874647
31	254 17 35.7	4 46.53	−20.8	+0 33 9.7	−5.94	0.7253521	0.7885562	0.7895917
Nov. 4	254 36 42.1	4 46.67	20.6	0 32 45.9	5.95	0.7252454	0.7905708	0.7914929
8	254 55 49.1	4 46.81	20.4	0 32 22.0	5.97	0.7251384	0.7923577	0.7931647
12	255 14 56.7	4 46.96	20.2	0 31 58.1	5.99	0.7250310	0.7939140	0.7946053
16	255 34 4.8	4 47.10	20.0	0 31 34.1	6.01	0.7249232	0.7952386	0.7958140
20	255 53 13.5	4 47.24	−19.8	+0 31 10.0	−6.03	0.7248152	0.7963311	0.7967897
24	256 12 22.7	4 47.39	19.6	0 30 45.9	6.04	0.7247067	0.7971894	0.7975301
28	256 31 32.6	4 47.53	19.4	0 30 21.7	6.06	0.7245981	0.7978114	0.7980330
Dec. 2	256 50 43.0	4 47.67	19.2	0 29 57.4	6.08	0.7244891	0.7981947	0.7982960
6	257 9 53.9	4 47.82	19.0	0 29 33.1	6.09	0.7243797	0.7983370	0.7983175
10	257 29 5.5	4 47.96	−18.7	+0 29 8.6	−6.11	0.7242701	0.7982378	0.7980980
14	257 48 17.6	4 48.10	18.5	0 28 44.2	6.13	0.7241601	0.7978982	0.7976385
18	258 7 30.3	4 48.25	18.3	0 28 19.6	6.14	0.7240498	0.7973189	0.7969397
22	258 26 43.6	4 48.39	18.1	0 27 55.0	6.16	0.7239394	0.7965006	0.7960017
26	258 45 57.5	4 48.54	17.9	0 27 30.3	6.18	0.7238285	0.7954429	0.7948240
30	259 5 12.0	4 48.69	−17.6	+0 27 5.6	−6.19	0.7237174	0.7941450	0.7934059
34	259 24 27.0	4 48.84	−17.4	+0 26 40.8	−6.21	0.7236060	0.7926070	

SATURN.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	′ ″	′ ″	° ′ ″	″			
Jan. 1	122 16 16.7	2 12.55	+0 32.1	+0 24 50.7	+5.68	0.9585058	0.9129297	0.9122413
5	122 25 6.9	2 12.53	0 32.5	0 25 13.4	5.68	0.9585350	0.9116139	0.9110491
9	122 33 57.0	2 12.51	0 33.0	0 25 36.1	5.68	0.9585644	0.9105480	0.9101120
13	122 42 47.0	2 12.49	0 33.5	0 25 58.8	5.67	0.9585940	0.9097419	0.9094389
17	122 51 36.9	2 12.47	0 34.0	0 26 21.5	5.67	0.9586236	0.9092032	0.9090355
21	123 0 26.8	2 12.45	+0 34.4	+0 26 44.2	+5.67	0.9586534	0.9089357	0.9089043
25	123 9 16.6	2 12.44	0 34.9	0 27 6.8	5.66	0.9586834	0.9089109	0.9090452
29	123 18 6.3	2 12.42	0 35.4	0 27 29.5	5.66	0.9587134	0.9092170	0.9094562
Feb. 2	123 26 55.9	2 12.40	0 35.9	0 27 52.1	5.66	0.9587436	0.9097620	0.9101341
6	123 35 45.5	2 12.38	0 36.4	0 28 14.7	5.65	0.9587739	0.9105717	0.9110741
10	123 44 35.0	2 12.36	+0 36.8	+0 28 37.3	+5.65	0.9588044	0.9116402	0.9122690
14	123 53 24.4	2 12.34	0 37.3	0 28 59.9	5.64	0.9588349	0.9129589	0.9137087
18	124 2 13.7	2 12.32	0 37.8	0 29 22.5	5.64	0.9588656	0.9145166	0.9153807
22	124 11 3.0	2 12.30	0 38.2	0 29 45.0	5.64	0.9588964	0.9162993	0.9172704
26	124 19 52.2	2 12.28	0 38.7	0 30 7.6	5.63	0.9589273	0.9182923	0.9193632
Mar. 1	124 28 41.3	2 12.26	+0 39.1	+0 30 30.1	+5.63	0.9589584	0.9204809	0.9216435
5	124 37 30.3	2 12.24	0 39.5	0 30 52.6	5.62	0.9589896	0.9228491	0.9240958
9	124 46 19.2	2 12.22	0 40.0	0 31 15.1	5.62	0.9590209	0.9253813	0.9267035
13	124 55 8.1	2 12.21	0 40.5	0 31 37.6	5.62	0.9590523	0.9280602	0.9294491
17	125 3 56.9	2 12.19	0 40.9	0 32 0.0	5.61	0.9590839	0.9308676	0.9323133
21	125 12 45.6	2 12.17	+0 41.4	+0 32 22.5	+5.61	0.9591155	0.9337840	0.9352773
25	125 21 34.2	2 12.15	0 41.8	0 32 44.9	5.61	0.9591473	0.9367912	0.9383234
29	125 30 22.8	2 12.13	0 42.3	0 33 7.3	5.60	0.9591793	0.9398719	0.9414347
Apr. 2	125 39 11.2	2 12.11	0 42.7	0 33 29.7	5.60	0.9592113	0.9430098	0.9445954
6	125 47 59.6	2 12.09	0 43.2	0 33 52.1	5.59	0.9592435	0.9461893	0.9477895
10	125 56 47.9	2 12.07	+0 43.6	+0 34 14.5	+5.59	0.9592758	0.9493941	0.9510010
14	126 5 36.2	2 12.05	0 44.1	0 34 36.8	5.59	0.9593082	0.9526083	0.9542137
18	126 14 24.3	2 12.03	0 44.5	0 34 59.1	5.58	0.9593407	0.9558157	0.9574124
22	126 23 12.4	2 12.01	0 45.0	0 35 21.5	5.58	0.9593734	0.9590022	0.9605835
26	126 32 0.4	2 11.99	0 45.4	0 35 43.8	5.57	0.9594062	0.9621550	0.9637152
30	126 40 48.3	2 11.97	+0 45.9	+0 36 6.0	+5.57	0.9594391	0.9652627	0.9667962
May 4	126 49 36.2	2 11.95	0 46.3	0 36 28.3	5.56	0.9594721	0.9683144	0.9698157
8	126 58 23.9	2 11.93	0 46.7	0 36 50.6	5.56	0.9595053	0.9712989	0.9727626
12	127 7 11.6	2 11.90	0 47.1	0 37 12.8	5.55	0.9595385	0.9742057	0.9756268
16	127 15 59.1	2 11.88	0 47.6	0 37 35.0	5 55	0.9595719	0.9770248	0.9783985
20	127 24 46.6	2 11.86	+0 48.0	+0 37 57.2	+5.54	0.9596054	0.9797471	0.9810695
24	127 33 34.0	2 11.84	0 48.4	0 38 19.3	5.54	0.9596390	0.9823650	0.9836329
28	127 42 21.4	2 11.82	0 48.9	0 38 41.5	5.54	0.9596728	0.9848725	0.9860829
June 1	127 51 8.6	2 11.80	0 49.3	0 39 3.6	5.53	0.9597066	0.9872633	0.9884131
5	127 59 55.8	2 11.78	0 49.7	0 39 25.7	5.53	0.9597406	0.9895315	0.9906175
9	128 8 42.8	2 11.76	+0 50.1	+0 39 47.8	+5.52	0.9597747	0.9916705	0.9926898
13	128 17 29.8	2 11.74	0 50.6	0 40 9.9	5.52	0.9598089	0.9936747	0.9946246
17	128 26 16.7	2 11.72	0 51.0	0 40 32.0	5.51	0.9598432	0.9955391	0.9964179
21	128 35 3.6	2 11.69	0 51.4	0 40 54.0	5.51	0.9598777	0.9972605	0.9980666
25	128 43 50.3	2 11.67	0 51.9	0 41 16.0	5.50	0.9599122	0.9988358	0.9995680
29	128 52 36.9	2 11.65	+0 52.3	+0 41 38.0	+5.50	0.9599469	1.0002626	1.0009192
July 3	129 1 23.5	2 11.63	+0 52.7	+0 42 0.0	+5.49	0.9599817	1.0015375	1.0021170

SATURN.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	′ ″	′ ″	° ′ ″	″			
July 3	129 1 23.5	2 11.63	+0 52.7	+0 42 0.0	+5.49	0.9599817	1.0015375	1.0021170
7	129 10 10.0	2 11.61	0 53.2	0 42 22.0	5.49	0.9600166	1.0026574	1.0031583
11	129 18 56.4	2 11.59	0 53.6	0 42 43.9	5.48	0.9600516	1.0036193	1.0040401
15	129 27 42.7	2 11.57	0 54.0	0 43 5.8	5.48	0.9600867	1.0044208	1.0047612
19	129 36 29.0	2 11.54	0 54.4	0 43 27.7	5.47	0.9601220	1.0050613	1.0053211
23	129 45 15.1	2 11.52	+0 54.8	+0 43 49.6	+5.47	0.9601574	1.0055404	1.0057191
27	129 54 1.1	2 11.50	0 55.2	0 44 11.5	5.46	0.9601928	1.0058571	1.0059545
31	130 2 47.1	2 11.48	0 55.6	0 44 33.3	5.46	0.9602284	1.0060109	1.0060263
Aug. 4	130 11 33.0	2 11.46	0 56.0	0 44 55.1	5.45	0.9602641	1.0060005	1.0059332
8	130 20 18.7	2 11.43	0 56 4	0 45 16.9	5.44	0.9602999	1.0058246	1.0056745
12	130 29 4.4	2 11.41	+0 56.8	+0 45 38.7	+5.44	0.9603358	1.0054833	1.0052510
16	130 37 50.0	2 11.39	0 57.2	0 46 0.4	5.43	0.9603719	1.0049778	1.0046641
20	130 46 35.6	2 11.37	0 57.6	0 46 22.2	5.43	0.9604080	1.0043099	1.0039153
24	130 55 21.0	2 11.34	0 58.0	0 46 43.9	5.42	0.9604443	1.0034805	1.0030057
28	131 4 6.3	2 11.32	0 58.4	0 47 5.6	5.42	0.9604807	1.0024910	1.0019364
Sept 1	131 12 51.6	2 11.30	+0 58.8	+0 47 27.2	+5.41	0.9605171	1.0013421	1.0007083
5	131 21 36.7	2 11.28	0 59.2	0 47 48.9	5.41	0.9605537	1.0000354	0.9993235
9	131 30 21.8	2 11.26	0 59.6	0 48 10.5	5.40	0.9605904	0.9985731	0.9977847
13	131 39 6.8	2 11.23	1 0.0	0 48 32.1	5.40	0.9606273	0.9969588	0.9960960
17	131 47 51.7	2 11.21	1 0.4	0 48 53.7	5.39	0.9606642	0.9951967	0.9942615
21	131 56 36.5	2 11.19	+1 0.8	+0 49 15.2	+5.39	0.9607012	0.9932910	0.9922856
25	132 5 21.2	2 11.17	1 1.2	0 49 36.8	5.38	0.9607384	0.9912459	0.9901720
29	132 14 5.8	2 11.15	1 1.6	0 49 58.3	5.38	0.9607756	0.9890650	0.9879253
Oct. 3	132 22 50.4	2 11.12	1 2.0	0 50 19.8	5.37	0.9608130	0.9867537	0.9855507
7	132 31 34.8	2 11.10	1 2.4	0 50 41.2	5.36	0.9608505	0.9843174	0.9830547
11	132 40 19.2	2 11.08	+1 2.7	+0 51 2.7	+5.36	0.9608880	0.9817638	0.9804458
15	132 49 3.4	2 11.05	1 3.1	0 51 24.1	5.35	0.9609257	0.9791018	0.9777326
19	132 57 47.6	2 11.03	1 3.5	0 51 45.5	5.34	0.9609635	0.9763395	0.9749235
23	133 6 31.6	2 11.01	1 3.8	0 52 6.8	5.34	0.9610014	0.9734856	0.9720268
27	133 15 15.6	2 10.98	1 4.2	0 52 28.2	5.33	0.9610394	0.9705484	0.9690518
31	133 23 59.5	2 10.96	+1 4.6	+0 52 49.5	+5.33	0.9610776	0.9675385	0.9660097
Nov. 4	133 32 43.3	2 10.93	1 4.9	0 53 10.8	5.32	0.9611157	0.9644672	0.9629124
8	133 41 27.0	2 10.91	1 5.3	0 53 32.0	5.31	0.9611541	0.9613473	0.9597737
12	133 50 10.6	2 10.89	1 5.7	0 53 53.3	5.31	0.9611925	0.9581934	0.9566082
16	133 58 54.1	2 10.86	1 6.1	0 54 14.5	5.30	0.9612311	0.9550197	0.9534296
20	134 7 37.5	2 10.84	+1 6.4	+0 54 35.7	+5.30	0.9612697	0.9518399	0.9502523
24	134 16 20.8	2 10.82	1 6.8	0 54 56.9	5.29	0.9613085	0.9486689	0.9470914
28	134 25 4.0	2 10.79	1 7.2	0 55 18.0	5.28	0.9613473	0.9455221	0.9439633
Dec. 2	134 33 47.2	2 10.77	1 7.5	0 55 39.1	5.28	0.9613863	0.9424173	0.9408862
6	134 42 30.2	2 10.75	1 7.9	0 56 0.2	5.27	0.9614254	0.9393724	0.9378784
10	134 51 13.1	2 10.72	+1 8.3	+0 56 21.3	+5.27	0.9614645	0.9364064	0.9349586
14	134 59 56.0	2 10.70	1 8.6	0 56 42.4	5.26	0.9615038	0.9335374	0.9321451
18	135 8 38.8	2 10.68	1 9.0	0 57 3.4	5.25	0.9615432	0.9307836	0.9294549
22	135 17 21.4	2 10.65	1 9.3	0 57 24.4	5.25	0.9615827	0.9281614	0.9269052
26	135 26 4.0	2 10.63	1 9.7	0 57 45.3	5.24	0.9616223	0.9256887	0.9245141
30	135 34 46.4	2 10.60	+1 10.0	+0 58 6.3	+5.23	0.9616620	0.9233836	0.9222995
34	135 43 28.8	2 10.58	+1 10.4	+0 58 27.2	+5.22	0.9617018	0.9212638	

URANUS.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	″	″	° ′ ″	″			
Jan. 1	194 0 33.7	46.28	−8.2	+0 39 57.3	−0.32	1.2640080	1.2660128	1.2643964
9	194 6 44.0	46.28	8.2	0 39 54.8	0.32	1.2640224	1.2627688	1.2611376
17	194 12 54.2	46.28	8.2	0 39 52.2	0.32	1.2640369	1.2595113	1.2578991
25	194 19 4.4	46.27	8.2	0 39 49.7	0.32	1.2640514	1.2563088	1.2547485
Feb. 2	194 25 14.6	46.27	8.3	0 39 47.1	0.32	1.2640661	1.2532260	1.2517493
10	194 31 24.7	46.27	−8.3	+0 39 44.6	−0.32	1.2640807	1.2503267	1.2489667
18	194 37 34.9	46.26	8.3	0 39 42.0	0.32	1.2640954	1.2476774	1.2464663
26	194 43 44.9	46.26	8.3	0 39 39.4	0.32	1.2641101	1.2453396	1.2443034
Mar. 5	194 49 55.0	46.26	8.3	0 39 36.8	0.32	1.2641244	1.2433636	1.2425259
13	194 56 5.0	46.25	8.3	0 39 34.2	0.32	1.2641397	1.2417958	1.2411777
21	195 2 15.0	46.25	−8.4	+0 39 31.6	−0.33	1.2641546	1.2406752	1.2402904
29	195 8 25.0	46.24	8.4	0 39 29.0	0.33	1.2641695	1.2400252	1.2398804
Apr. 6	195 14 34.9	46.24	8.4	0 39 26.4	0.33	1.2641845	1.2398569	1.2399553
14	195 20 44.9	46.24	8.4	0 39 23.8	0.33	1.2641995	1.2401749	1.2405133
22	195 26 54.7	46.23	8.4	0 39 21.1	0.33	1.2642145	1.2409680	1.2415355
30	195 33 4.6	46.23	−8.4	+0 39 18.5	−0.33	1.2642296	1.2422115	1.2429927
May 8	195 39 14.4	46.23	8.4	0 39 15.9	0.33	1.2642448	1.2438743	1.2448514
16	195 45 24.2	46.22	8.5	0 39 13.2	0.33	1.2642600	1.2459175	1.2470658
24	195 51 34.0	46.22	8.5	0 39 10.5	0.33	1.2642752	1.2482904	1.2495834
June 1	195 57 43.7	46.21	8.5	0 39 7.9	0.33	1.2642905	1.2509387	1.2523493
9	196 3 53.4	46.21	−8.5	+0 39 5.2	−0.34	1.2643059	1.2538084	1.2553079
17	196 10 3.1	46.21	8.5	0 39 2.5	0.34	1.2643213	1.2568399	1.2583968
25	196 16 12.7	46.20	8.5	0 38 59.8	0.34	1.2643367	1.2599713	1.2615566
July 3	196 22 22.4	46.20	8.5	0 38 57.1	0.34	1.2643522	1.2631462	1.2647328
11	196 28 31.9	46.20	8.6	0 38 54.4	0.34	1.2643677	1.2663092	1.2678684
19	196 34 41.5	46.19	−8.6	+0 38 51.7	−0.34	1.2643833	1.2694037	1.2709089
27	196 40 51.0	46.19	8.6	0 38 49.0	0.34	1.2643990	1.2723788	1.2738078
Aug. 4	196 47 0.5	46.18	8.6	0 38 46.2	0.34	1.2644146	1.2751904	1.2765207
12	196 53 10.0	46.18	8.6	0 38 43.5	0.34	1.2644304	1.2777937	1.2790044
20	196 59 19.4	46.18	8.6	0 38 40.8	0.34	1.2644461	1.2801484	1.2812220
28	197 5 28.8	46.17	−8.6	+0 38 38.0	−0.34	1.2644620	1.2822221	1.2831446
Sept. 5	197 11 38.2	46.17	8.7	0 38 35.3	0.35	1.2644778	1.2839860	1.2847424
13	197 17 47.5	46.16	8.7	0 38 32.5	0.35	1.2644938	1.2854112	1.2859004
21	197 23 56.8	46.16	8.7	0 38 29.7	0.35	1.2645097	1.2864780	1.2868724
29	197 30 6.1	46.16	8.7	0 38 26.9	0.35	1.2645257	1.2871721	1.2873755
Oct. 7	197 36 15.3	46.15	−8.7	+0 38 24.2	−0.35	1.2645418	1.2874807	1.2874873
15	197 42 24.5	46.15	8.7	0 38 21.4	0.35	1.2645579	1.2873954	1.2872053
23	197 48 33.7	46.14	8.7	0 38 18.6	0.35	1.2645740	1.2869176	1.2865329
31	197 54 42.8	46.14	8.7	0 38 15.7	0.35	1.2645903	1.2860514	1.2854743
Nov. 8	198 0 51.9	46.13	8.8	0 38 12.9	0.35	1.2646065	1.2848035	1.2840413
16	198 7 1.0	46.13	−8.8	+0 38 10.1	−0.35	1.2646228	1.2831905	1.2822544
24	198 13 10.0	46.13	8.8	0 38 7.3	0.35	1.2646392	1.2812359	1.2801381
Dec. 2	198 19 19.0	46.12	8.8	0 38 4.4	0.35	1.2646556	1.2789649	1.2777204
10	198 25 27.9	46.12	8.8	0 38 1.6	0.36	1.2646721	1.2764100	1.2750395
18	198 31 36.9	46.11	8.8	0 37 58.8	0.36	1.2646886	1.2736145	1.2721405
26	198 37 45.8	46.11	−8.8	+0 37 55.9	−0.36	1.2647051	1.2706236	1.2690697
34	198 43 54.6	46.11	−8.8	+0 37 53.0	−0.36	1.2647217	1.2674862	

NEPTUNE.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth— At Date.	Logarithm of Distance from Earth— At Intermediate Date.
	° ′ ″	″	″	° ′ ″	″			
Jan. 1	58 55 1 1	22.00	−29.8	−1 41 23.2	+0.22	1.4744966	1.4637789	1.4645121
9	58 57 57.0	22.00	29.8	1 41 21.5	0.22	1.4744972	1.4652941	1.4661213
17	59 0 53.0	22.00	29.9	1 41 19.8	0.22	1.4744979	1.4669883	1.4678902
25	59 3 49.0	22.00	30.0	1 41 18.1	0.22	1.4744985	1.4688221	1.4697790
Feb. 2	59 6 44.9	22.00	30.0	1 41 16.3	0.22	1.4744992	1.4707561	1.4717489
10	59 9 40.9	22.00	−30.1	−1 41 14.6	+0.22	1.4744999	1.4727520	1.4737604
18	59 12 36.8	22.00	30.2	1 41 12.8	0.22	1.4745006	1.4747688	1.4757718
26	59 15 32.8	22.00	30.3	1 41 11.1	0.22	1.4745013	1.4767652	1.4777445
Mar. 5	59 18 28.8	21.99	30.3	1 41 9.3	0.22	1.4745020	1.4787055	1.4796437
13	59 21 24.7	21.99	30.4	1 41 7.6	0.22	1.4745028	1.4805551	1.4814352
21	59 24 20 7	21.99	−30.4	−1 41 5.8	+0.22	1.4745035	1.4822807	1.4830877
29	59 27 16.6	21.99	30.5	1 41 4.1	0.22	1.4745042	1.4838535	1.4845751
Apr. 6	59 30 12.6	21.99	30.6	1 41 2.3	0.22	1.4745050	1.4852499	1.4858750
14	59 33 8.5	21.99	30.6	1 41 0.5	0.22	1.4745057	1.4864483	1.4869670
22	59 36 4.5	21.99	30.7	1 40 58.7	0.22	1.4745065	1.4874299	1.4878354
30	59 39 0.4	21.99	−30.8	−1 40 57.0	+0.22	1.4745073	1.4881823	1.4884697
May 8	59 41 56.4	21.99	30.9	1 40 55.2	0.22	1.4745081	1.4886964	1.4888611
16	59 44 52.3	21.99	30.9	1 40 53.4	0.22	1.4745089	1.4889639	1.4890043
24	59 47 48.3	21.99	31.0	1 40 51.6	0.22	1.4745097	1.4889829	1.4888998
June 1	59 50 44.2	21.99	31.1	1 40 49.8	0.23	1.4745105	1.4887555	1.4885501
9	59 53 40.2	21.99	−31.1	−1 40 48.0	+0.23	1.4745113	1.4882848	1.4879600
17	59 56 36.1	21.99	31.2	1 40 46.2	0.23	1.4745121	1.4875776	1.4871390
25	59 59 32.1	21.99	31.2	1 40 44.4	0.23	1.4745130	1.4866461	1.4861008
July 3	60 2 28.0	21.99	31.3	1 40 42.5	0.23	1.4745138	1.4855050	1.4848602
11	60 5 24.0	21.99	31.4	1 40 40.7	0.23	1.4745147	1.4841695	1.4834352
19	60 8 19.9	21.99	−31.5	−1 40 38.9	+0.23	1.4745155	1.4826606	1.4818490
27	60 11 15.9	21.99	31.5	1 40 37.1	0.23	1.4745164	1.4810033	1.4801264
Aug. 4	60 14 11.8	21.99	31.6	1 40 35.2	0.23	1.4745173	1.4792221	1.4782936
12	60 17 7.7	21.99	31.6	1 40 33.4	0.23	1.4745182	1.4773455	1.4763819
20	60 20 3.7	21.99	31.7	1 40 31.5	0.23	1.4745192	1.4754069	1.4744247
28	60 22 59.6	21.99	−31.8	−1 40 29.7	+0.23	1.4745201	1.4734395	1.4724551
Sept. 5	60 25 55.5	21.99	31.8	1 40 27.8	0.23	1.4745210	1.4714769	1.4705099
13	60 28 51.5	21.99	31.9	1 40 26.0	0.23	1.4745220	1.4695585	1.4686275
21	60 31 47.4	21.99	32.0	1 40 24.1	0.23	1.4745229	1.4677212	1.4668442
29	60 34 43.4	21 99	32.0	1 40 22.3	0.23	1.4745239	1.4660010	1.4651962
Oct. 7	60 37 39.3	21.99	−32.1	−1 40 20.4	+0.23	1.4745249	1.4644344	1.4637202
15	60 40 35.2	21.99	32.2	1 40 18.5	0.23	1.4745258	1.4630571	1.4624494
23	60 43 31.1	21.99	32.2	1 40 16.6	0.23	1.4745268	1.4618999	1.4614121
31	60 46 27.1	21.99	32.3	1 40 14.8	0.24	1.4745278	1.4609888	1.4606331
Nov. 8	60 49 23.0	21.99	32.3	1 40 12.9	0.24	1.4745289	1.4603470	1.4601333
16	60 52 19.0	21 99	−32.4	−1 40 11.0	+0.24	1.4745299	1.4599925	1.4599255
24	60 55 14.9	21.99	32.5	1 40 9.1	0.24	1.4745309	1.4599325	1.4600142
Dec. 2	60 58 10.8	21 99	32.5	1 40 7.2	0.24	1.4745320	1.4601706	1.4604012
10	61 1 6.8	21.99	32.6	1 40 5.3	0.24	1.4745330	1.4607041	1.4610779
18	61 4 2 7	21.99	32.7	1 40 3.4	0.24	1.4745341	1.4615199	1.4620278
26	61 6 58.6	21.99	−32.7	−1 40 1.5	+0.24	1.4745352	1.4625986	1.4632300
34	61 9 54.6	21.99	−32.8	−1 39 59.5	+0.24	1.4745363	1.4639177	

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
Jan. 0	+0.1632047	+0.1718201	+611	−0.8894711	−0.8881031	+218	−0.3858652	−0.3852715	−244
1	0.1804225	0.1890111	600	0.8866663	0.8851609	226	0.3846478	0.3839945	239
2	0.1975855	0.2061448	589	0.8835867	0.8819440	234	0.3833111	0.3825983	234
3	0.2146885	0.2232157	579	0.8802327	0.8784530	241	0.3818555	0.3810834	229
4	0.2317258	0.2402183	568	0.8766051	0.8746889	248	0.3802814	0.3794501	224
5	+0.2486923	+0.2571474	+558	−0.8727048	−0.8706526	+254	−0.3785891	−0.3776988	−219
6	0.2655829	0.2739981	547	0.8685326	0.8663449	260	0.3767790	0.3758299	214
7	0.2823925	0.2907653	537	0.8640896	0.8617670	266	0.3748515	0.3738440	209
8	0.2991159	0.3074435	527	0.8593771	0 8569201	272	0.3728072	0.3717415	204
9	0.3157475	0.3240270	517	0.8543961	0.8518053	277	0.3706465	0.3695228	199
10	+0.3322815	+0.3405102	+507	−0.8491478	−0.8464238	+282	−0.3683700	−0.3671886	−194
11	0.3487125	0.3568877	496	0.8436335	0.8407773	286	0.3659783	0.3647396	189
12	0.3650352	0.3731543	486	0.8378551	0.8348677	291	0.3634721	0.3621765	184
13	0.3812444	0.3893047	476	0.8318147	0.8286970	295	0.3608524	0.3595003	179
14	0.3973346	0.4053334	465	0.8255144	0.8222674	299	0.3581200	0.3567118	174
15	+0.4133004	+0.4212351	+455	−0.8189562	−0.8155810	+303	−0.3552758	−0.3538120	−169
16	0.4291367	0.4370046	444	0.8121422	0.8086402	307	0.3523206	0.3508017	164
17	0.4448382	0.4526367	434	0.8050751	0.8014476	309	0.3492555	0.3476821	159
18	0.4603997	0.4681263	423	0.7977577	0.7940058	312	0.3460817	0.3444543	154
19	0.4758161	0.4834685	413	0.7901923	0.7863174	314	0.3428003	0.3411194	149
20	+0.4910829	+0.4986589	+403	−0.7823815	−0.7783850	+316	−0.3394123	−0.3376787	−144
21	0.5061959	0.5136934	393	0.7743282	0.7702116	318	0.3359191	0.3341333	140
22	0.5211507	0.5285674	383	0.7660356	0.7618005	320	0.3323217	0.3304844	135
23	0.5359428	0.5432765	373	0.7575067	0.7531546	321	0.3286216	0.3267335	131
24	0.5505678	0.5578164	363	0.7487444	0.7442766	322	0.3248201	0.3228818	126
25	+0.5650216	+0.5721831	+353	−0.7397515	−0.7351694	+323	−0.3209186	−0.3189306	−122
26	0.5793002	0.5863726	343	0.7305307	0.7258357	324	0.3169181	0.3148811	117
27	0.5933996	0.6003808	333	0.7210849	0.7162785	324	0.3128198	0.3107344	113
28	0.6073157	0.6142038	324	0.7114169	0.7065006	324	0.3086250	0.3064919	109
29	0.6210446	0.6278377	314	0.7015297	0.6965050	324	0.3043352	0.3021551	104
30	+0.6345825	+0.6412786	+304	−0.6914266	−0.6862949	+324	−0.2999517	−0.2977253	− 99
31	0.6479256	0.6545228	295	0.6811104	0.6758732	323	0.2954759	0.2932037	95
Feb. 1	0.6610700	0.6675664	286	0.6705837	0.6652424	322	0.2909090	0.2885917	91
2	0.6740118	0.6804054	277	0.6598495	0.6544056	321	0.2862522	0.2838904	87
3	0.6867470	0.6930358	268	0.6489109	0.6433660	320	0.2815067	0.2791011	83
4	+0.6992715	+0.7054535	+259	−0.6377711	−0.6321268	+318	−0.2766739	−0.2742253	− 79
5	0.7115814	0.7176546	250	0.6264334	0.6206915	317	0.2717554	0.2692646	75
6	0.7236727	0.7296351	241	0.6149013	0.6090635	315	0.2667528	0.2642206	71
7	0.7355414	0.7413912	232	0.6031783	0.5972464	313	0.2616677	0.2590947	67
8	0.7471839	0.7529190	224	0.5912681	0.5852439	311	0.2565014	0.2538884	63
9	+0.7585962	+0.7642148	+216	−0.5791742	−0.5730595	+309	−0.2512555	−0.2486033	− 59
10	0.7697745	0.7752747	208	0.5669003	0.5606972	306	0.2459316	0.2432410	55
11	0.7807151	0.7860951	200	0.5544507	0.5481612	304	0.2405316	0.2378035	51
12	0.7914144	0.7966726	192	0.5418295	0.5354558	301	0.2350571	0.2322924	47
13	0.8018693	0.8070041	184	0.5290408	0.5225851	298	0.2295098	0.2267096	43
14	+0.8120766	+0.8170864	+177	−0.5160891	−0.5095536	+295	−0.2238918	−0.2210569	− 40
15	+0.8220331	+0.8269162	+169	−0.5029790	−0.4963659	+292	−0.2182049	−0.2153363	− 36

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
Feb. 15	+0.8220331	+0.8269162	+169	−0.5029790	−0.4963659	+292	−0.2182049	−0.2153363	−36
16	0.8317355	0.8364906	162	0.4897150	0.4830265	289	0.2124511	0.2095498	32
17	0.8411811	0.8458068	155	0.4763015	0.4695400	286	0.2066323	0.2036992	28
18	0.8503674	0.8548626	148	0.4627429	0.4559106	283	0.2007504	0.1977866	25
19	0.8592922	0.8636559	141	0.4490437	0.4421427	280	0.1948075	0.1918137	22
20	+0.8679535	+0.8721845	+135	−0.4352082	−0.4282409	+276	−0.1888052	−0.1857825	−19
21	0.8763490	0.8804462	128	0.4212412	0.4142098	273	0.1827456	0.1796951	16
22	0.8844764	0.8884389	122	0.4071472	0.4000539	269	0.1766308	0.1735534	12
23	0.8923337	0.8961607	115	0.3929304	0.3857773	265	0.1704627	0.1673593	9
24	0.8999194	0.9036099	109	0.3785951	0.3713843	261	0.1642432	0.1611147	6
25	+0.9072318	+0.9107849	+103	−0.3641455	−0.3568792	+257	−0.1579740	−0.1548214	− 3
26	0.9142690	0.9176838	97	0.3495860	0.3422663	253	0.1516571	0.1484814	+ 1
27	0.9210292	0.9243048	91	0.3349208	0.3275498	249	0.1452944	0.1420965	4
28	0.9275105	0.9306461	85	0.3201540	0.3127338	244	0.1388878	0.1356686	7
29	0.9337114	0.9367063	79	0.3052898	0.2978225	240	0.1324391	0.1291995	10
Mar. 1	+0.9396305	+0.9424836	+ 74	−0.2903325	−0.2828203	+235	−0.1259501	−0.1226911	+14
2	0.9452657	0.9479763	69	0.2752864	0.2677315	231	0.1194227	0.1161452	17
3	0.9506153	0.9531826	64	0.2601559	0.2525603	226	0.1128588	0.1095637	20
4	0.9556779	0.9581011	59	0.2449453	0.2373113	221	0.1062602	0.1029486	23
5	0.9604519	0.9627302	54	0.2296592	0.2219892	216	0.0996290	0.0963019	25
6	+0.9649357	+0.9670683	+ 49	−0.2143021	−0.2065984	+211	−0.0929673	−0.0896257	+28
7	0.9691277	0.9711139	45	0.1988787	0.1911436	207	0.0862770	0.0829219	31
8	0.9730265	0.9748656	40	0.1833937	0.1756296	202	0.0795601	0.0761123	34
9	0.9766308	0.9783222	36	0.1678519	0.1600612	197	0.0728184	0.0694390	36
10	0.9799393	0.9814825	32	0.1522581	0.1444434	192	0.0660541	0.0626642	39
11	+0.9829511	+0.9843457	+ 28	−0.1366175	−0.1287814	+187	−0.0592695	−0.0558703	+41
12	0.9856655	0.9869110	24	0.1209354	0.1130805	182	0.0524669	0.0490595	44
13	0.9880818	0.9891779	21	0.1052169	0.0973455	177	0.0456483	0.0422338	46
14	0.9901993	0.9911459	17	0.0894667	0.0815813	172	0.0388159	0.0353953	49
15	0.9920176	0.9928147	14	0.0736898	0.0657930	167	0.0319718	0.0285461	51
16	+0.9935368	+0.9941843	+ 11	−0.0578915	−0.0499859	+162	−0.0251182	−0.0216886	+53
17	0.9947569	0.9952548	8	0.0420769	0.0341651	156	0.0182574	0.0148250	55
18	0.9956779	0.9960263	5	0.0262511	0.0183355	151	0.0113915	0.0079574	58
19	0.9962999	0.9964990	+ 2	−0.0104189	−0.0025020	146	−0.0045227	−0.0010880	60
20	0.9966234	0.9966735	− 1	+0.0054148	+0.0133306	141	+0.0023468	+0.0057811	62
21	+0.9966493	+0.9965507	− 4	+0.0212452	+0.0291578	+135	+0.0092149	+0.0126479	+64
22	0.9963779	0.9961311	6	0.0370678	0.0449750	130	0.0160798	0.0195105	67
23	0.9958102	0.9954154	8	0.0528784	0.0607778	124	0.0229396	0.0263669	69
24	0.9949466	0.9944042	10	0.0686724	0.0765617	119	0.0297921	0.0332150	71
25	0.9937879	0.9930984	12	0.0844450	0.0923220	113	0.0366353	0.0400527	73
26	+0.9923351	+0.9914987	− 14	+0.1001918	+0.1080543	+108	+0.0434671	+0.0468781	+75
27	0.9905888	0.9896059	16	0.1159085	0.1237543	102	0.0502857	0.0536895	77
28	0.9885497	0.9874207	17	0.1315908	0.1394179	96	0.0570894	0.0604851	79
29	0.9862187	0.9849440	19	0.1472347	0.1550410	90	0.0638765	0.0672629	81
30	0.9835966	0.9821766	20	0.1628360	0.1706193	84	0.0706447	0.0740210	83
31	+0.9806841	+0.9791192	− 21	+0.1783903	+0.1861484	+ 78	+0.0773921	+0.0807575	+85
32	+0.9774821	+0.9757728	− 22	+0.1938930	+0.2016236	+ 72	+0.0841171	+0.0874706	+87

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
Apr. 1	+0.9774821	+0.9757728	− 22	+0.1938930	+0.2016236	+ 72	+0.0841171	+0.0874706	+ 87
2	0.9739915	0.9721383	23	0.2093396	0.2170405	66	0.0908179	0.0941584	89
3	0.9702132	0.9682164	23	0.2247260	0.2323951	61	0.0974924	0.1008191	91
4	0.9661480	0.9640081	23	0.2400477	0.2476828	55	0.1041386	0.1074506	92
5	0.9617969	0.9595146	23	0.2553001	0.2628988	49	0.1107547	0.1140509	94
6	+0.9571613	+0.9547373	− 24	+0.2704783	+0.2780383	+ 43	+0.1173387	+0.1206181	+ 96
7	0.9522426	0.9496776	24	0.2855779	0.2930967	37	0.1238886	0.1271501	98
8	0.9470423	0.9443371	23	0.3005940	0.3080693	31	0.1304023	0.1336450	99
9	0.9415621	0.9387176	23	0.3155219	0.3229515	25	0.1368779	0.1401008	101
10	0.9358038	0.9328208	23	0.3303573	0.3377389	19	0.1433134	0.1465156	103
11	+0.9297689	+0.9266485	− 22	+0.3450956	+0.3524268	+ 13	+0.1497070	+0.1528874	+105
12	0.9234595	0.9202027	21	0.3597320	0.3670106	7	0.1560566	0.1592142	106
13	0.9168783	0.9134866	20	0.3742620	0.3814858	+ 1	0.1623602	0.1654940	108
14	0.9100278	0.9065023	19	0.3886813	0.3958480	− 5	0.1686157	0.1717249	110
15	0.9029105	0.8992524	18	0.4029853	0.4100927	11	0.1748214	0.1779050	112
16	+0.8955287	+0.8917395	− 16	+0.4171698	+0.4242159	− 17	+0.1809754	+0.1840325	+113
17	0.8878852	0.8839663	14	0.4312307	0.4382137	23	0.1870759	0.1901057	115
18	0.8799830	0.8759358	12	0.4451644	0.4520824	29	0.1931213	0.1961229	117
19	0.8718250	0.8676508	10	0.4589673	0.4658184	35	0.1991100	0.2020825	119
20	0.8634138	0.8591141	7	0.4726355	0.4794178	40	0.2050402	0.2079828	120
21	+0.8547522	+0.8503286	− 4	+0.4861650	+0.4928766	− 46	+0.2109102	+0.2138221	+122
22	0.8458435	0.8412974	− 1	0.4995522	0.5061915	51	0.2167184	0.2195989	124
23	0.8366906	0.8320235	+ 2	0.5127940	0.5193594	57	0.2224634	0.2253119	126
24	0.8272964	0.8225097	5	0.5258872	0.5323769	62	0.2281439	0.2309595	128
25	0.8176637	0.8127589	8	0.5388283	0.5452407	68	0.2337583	0.2365403	130
26	+0.8077954	+0.8027739	+ 12	+0.5516139	+0.5579473	− 73	+0.2393051	+0.2420527	+131
27	0.7976943	0.7925574	16	0.5642405	0.5704933	79	0.2447826	0.2474951	133
28	0.7873632	0.7821122	20	0.5767050	0.5828756	84	0.2501895	0.2528662	134
29	0.7768048	0.7714412	24	0.5890043	0.5950910	90	0.2555246	0.2581649	136
30	0.7660219	0.7605472	28	0.6011350	0.6071361	95	0.2607866	0.2633897	138
May 1	+0.7550175	+0.7494333	+ 32	+0.6130937	+0.6190075	−100	+0.2659740	+0.2685392	+140
2	0.7437949	0.7381027	37	0.6248770	0.6307016	105	0.2710852	0.2736117	141
3	0.7323571	0.7265584	42	0.6364810	0.6422147	110	0.2761185	0.2786056	143
4	0.7207071	0.7148035	47	0.6479024	0.6535436	115	0.2810726	0.2835196	144
5	0.7088481	0.7028413	52	0.6591381	0.6646852	120	0.2859462	0.2883524	146
6	+0.6967835	+0.6906753	+ 58	+0.6701847	+0.6756359	−124	+0.2907379	+0.2931025	+147
7	0.6845169	0.6783091	63	0.6810386	0.6863923	129	0.2954461	0.2977685	149
8	0.6720520	0.6657464	69	0.6916964	0.6969510	133	0.3000694	0.3023488	151
9	0.6593925	0.6529910	75	0.7021552	0.7073090	137	0.3046064	0.3068421	153
10	0.6465424	0.6400471	81	0.7124117	0.7174631	141	0.3090558	0.3112472	155
11	+0.6335057	+0.6269187	+ 87	+0.7224626	+0.7274101	−145	+0.3134163	+0.3155627	+157
12	0.6202866	0.6136100	94	0.7323051	0.7371473	149	0.3176865	0.3197874	159
13	0.6068893	0.6001252	101	0.7419364	0.7466719	153	0.3218652	0.3239199	161
14	0.5933181	0.5864687	108	0.7513537	0.7559813	156	0.3259511	0.3279591	163
15	0.5795775	0.5726449	115	0.7605545	0.7650729	159	0.3299432	0.3319038	165
16	+0.5656717	+0.5586581	+122	+0.7695363	+0.7739444	−162	+0.3338403	+0.3357530	+167
17	+0.5516048	+0.5445124	+129	+0.7782969	+0.7825936	−165	+0.3376415	+0.3395059	+169

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
May 17	+0.5516048	+0.5445124	+129	+0.7782969	+0.7825936	−165	+0.3376415	+0.3395059	+169
18	0.5373813	0.5302123	137	0.7868342	0.7910185	167	0.3413458	0.3431614	171
19	0.5230059	0.5157626	144	0.7951464	0.7992175	170	0.3449523	0.3467187	173
20	0.5084831	0.5011677	152	0.8032317	0.8071886	172	0.3484602	0.3501770	175
21	0.4938171	0.4864316	160	0.8110880	0.8149297	174	0.3518687	0.3535354	176
22	+0.4790119	+0.4715584	+168	+0.8187133	+0.8224389	−175	+0.3551770	+0.3567932	+178
23	0.4640717	0.4565523	176	0.8261060	0.8297147	177	0.3583842	0.3599496	180
24	0.4490008	0.4414176	185	0.8332645	0.8367555	178	0.3614896	0.3630039	182
25	0.4338034	0.4261584	193	0.8401872	0.8435597	179	0.3644925	0.3659554	184
26	0.4184835	0.4107787	202	0.8468725	0.8501256	179	0.3673923	0.3688033	186
27	+0.4030449	+0.3952824	+211	+0.8533187	+0.8564516	−180	+0.3701882	+0.3715470	+188
28	0.3874918	0.3796737	220	0.8595240	0.8625358	180	0.3728796	0.3741858	190
29	0.3718284	0.3639567	228	0.8654868	0.8683767	180	0.3754657	0.3767189	192
30	0.3560589	0.3481356	237	0.8712055	0.8739727	180	0.3779457	0.3791457	194
31	0.3401872	0.3322144	246	0.8766783	0.8793220	180	0.3803191	0.3814655	196
June 1	+0.3242176	+0.3161975	+255	+0.8819034	+0.8844226	−179	+0.3825852	+0.3836777	+199
2	0.3081546	0.3000895	264	0.8868791	0.8892729	178	0.3847432	0.3857814	201
3	0.2920028	0.2838950	273	0.8916036	0.8938714	177	0.3867924	0.3877760	203
4	0.2757668	0.2676186	282	0.8960757	0.8982166	176	0.3887322	0.3896608	205
5	0.2594512	0.2512651	292	0.9002938	0.9023071	174	0.3905620	0.3914353	208
6	+0.2430609	+0.2348392	+301	+0.9042564	+0.9061415	−172	+0.3922810	+0.3930987	+210
7	0.2266006	0.2183458	310	0.9079622	0.9097184	170	0.3938886	0.3946505	212
8	0.2100753	0.2017899	319	0.9114098	0.9130365	167	0.3953845	0.3960904	214
9	0.1934899	0.1851764	329	0.9145982	0.9160950	164	0.3967682	0.3974179	217
10	0.1768496	0.1685105	338	0.9175267	0.9188933	161	0.3980393	0.3986325	219
11	+0.1601595	+0.1517974	+347	+0.9201947	+0.9214307	−157	+0.3991973	+0.3997339	+221
12	0.1434246	0.1350420	356	0.9226015	0.9237067	153	0.4002420	0.4007218	223
13	0.1266499	0.1182493	365	0.9247464	0.9257206	149	0.4011732	0.4015961	226
14	0.1098405	0.1014244	374	0.9266291	0.9274721	145	0.4019907	0.4023567	228
15	0.0930014	0.0845724	383	0.9282494	0.9289612	140	0.4026943	0.4030034	231
16	+0.0761377	+0.0676982	+392	+0.9296074	+0.9301880	−135	+0.4032840	+0.4035361	+233
17	0.0592542	0.0508065	401	0.9307031	0.9311526	130	0.4037597	0.4039548	236
18	0.0423555	0.0339018	410	0.9315365	0.9318550	124	0.4041215	0.4042597	238
19	0.0254461	0.0169889	418	0.9321079	0.9322955	118	0.4043695	0.4044509	241
20	+0.0085309	+0.0000726	427	0.9324175	0.9324743	111	0.4045038	0.4045284	243
21	−0.0083853	−0.0168425	+435	+0.9324656	+0.9323916	−104	+0.4045244	+0.4044922	+246
22	0.0252982	0.0337521	443	0.9322522	0.9320476	97	0.4044315	0.4043425	248
23	0.0422036	0.0506521	451	0.9317777	0.9314426	89	0.4042251	0.4040794	251
24	0.0590971	0.0675380	459	0.9310422	0.9305767	81	0.4039054	0.4037031	254
25	0.0759741	0.0844051	467	0.9300459	0.9294501	73	0.4034726	0.4032138	257
26	−0.0928301	−0.1012489	+475	+0.9287891	+0.9280631	− 65	+0.4029268	+0.4026116	+260
27	0.1096608	0.1180653	482	0.9272721	0.9264161	56	0.4022681	0.4018965	262
28	0.1264618	0.1348498	490	0.9254951	0.9245092	47	0.4014966	0.4010687	265
29	0.1432286	0.1515978	497	0.9234582	0.9223425	38	0.4006125	0.4001283	268
30	0.1599568	0.1683048	504	0.9211617	0.9199163	29	0.3996159	0.3990755	271
31	−0.1766415	−0.1849660	+511	+0.9186060	+0.9172311	− 19	+0.3985070	+0.3979105	+273
32	−0.1932780	−0.2015767	+518	+0.9157915	+0.9142873	− 10	+0.3972859	+0.3966334	+276

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
July 1	−0.1766415	−0.1849660	+511	+0.9186060	+0.9172311	− 19	+0.3985070	+0.3979105	+273
2	0.1932780	0.2015767	518	0.9157915	0.9142873	− 10	0.3972859	0.3966334	276
3	0.2098616	0.2181320	524	0.9127185	0.9110853	0	0.3959528	0.3952444	279
4	0.2263874	0.2346270	530	0.9093875	0.9076256	+ 10	0.3945079	0.3937437	282
5	0.2428503	0.2510567	536	0.9057993	0.9039090	21	0.3929515	0.3921317	285
6	−0.2592457	−0.2674166	+542	+0.9019547	+0.8999365	+ 31	+0.3912841	+0.3904089	+288
7	0.2755688	0.2837016	547	0.8978547	0.8957092	42	0.3895061	0.3885757	290
8	0.2918143	0.2999064	552	0.8935003	0.8912281	53	0.3876179	0.3866326	293
9	0.3079773	0.3160262	557	0.8888927	0.8864945	65	0.3856198	0.3845799	296
10	0.3240528	0.3320561	562	0.8840335	0.8815101	77	0.3835125	0.3824182	299
11	−0.3400358	−0.3479912	+566	+0.8789243	+0.8762764	+ 89	+0.3812967	+0.3801484	+301
12	0.3559217	0.3638268	570	0.8735665	0.8707950	101	0.3789731	0.3777712	304
13	0.3717059	0.3795585	574	0.8679619	0 8650677	114	0.3765424	0.3752872	306
14	0.3873838	0.3951816	577	0.8621125	0.8590966	126	0.3740054	0.3726972	309
15	0.4029509	0.4106916	580	0.8560202	0.8528836	139	0.3713627	0.3700021	311
16	−0.4184029	−0.4260843	+583	+0.8496869	+0.8464307	+151	+0.3686154	+0.3672028	+314
17	0.4337354	0.4413555	585	0.8431148	0.8397400	164	0.3657643	0.3643002	316
18	0.4489444	0.4565013	587	0.8363060	0.8328137	177	0.3628104	0.3612952	319
19	0.4640260	0.4715177	589	0.8292628	0.8256540	190	0.3597546	0.3581888	322
20	0.4789762	0.4864007	591	0.8219872	0.8182629	203	0.3565979	0.3549819	325
21	−0.4937910	−0.5011464	+592	+0.8144811	+0.8106423	+217	+0.3533411	+0.3516754	+328
22	0.5084665	0.5157508	593	0.8067465	0.8027943	231	0.3499851	0.3482702	331
23	0.5229988	0.5302099	593	0.7987856	0.7947211	244	0.3465309	0.3447673	334
24	0.5373839	0.5445201	593	0.7906007	0.7864249	257	0.3429795	0.3411676	337
25	0.5516183	0.5586779	593	0.7821936	0.7779074	271	0.3393318	0.3374720	339
26	−0.5656984	−0.5726794	+592	+0.7735661	+0.7691705	+285	+0.3355886	+0.3336814	+342
27	0.5796203	0.5865206	591	0.7647203	0.7602163	299	0.3317507	0.3297966	344
28	0.5933799	0.6001976	590	0.7556584	0.7510472	313	0.3278192	0.3258187	347
29	0.6069733	0.6137064	588	0.7463827	0.7416655	327	0.3237951	0.3217487	349
30	0.6203965	0.6270429	586	0.7368956	0.7320735	341	0.3196795	0.3175876	351
31	−0.6336453	−0.6402030	+584	+0.7271993	+0.7222733	+355	+0.3154733	+0.3133364	+353
Aug. 1	0.6467157	0.6531827	581	0.7172959	0.7122673	369	0.3111773	0.3089960	356
2	0.6596037	0.6659781	578	0.7071879	0.7020580	384	0.3067926	0.3045675	358
3	0.6723054	0.6785851	575	0.6968780	0.6916483	398	0.3023205	0.3000522	360
4	0.6848167	0.6909996	571	0.6863692	0.6810410	413	0.2977623	0.2954512	362
5	−0.6971334	−0.7032175	+567	+0.6756642	+0.6702389	+427	+0.2931190	+0.2907658	+365
6	0.7092516	0.7152350	562	0.6647657	0.6592451	441	0.2883919	0.2859973	367
7	0.7211674	0.7270483	557	0.6536772	0.6480629	455	0.2835823	0.2811470	369
8	0.7328774	0.7386540	552	0.6424022	0.6366959	469	0.2786916	0.2762163	371
9	0.7443779	0.7500483	547	0.6309441	0.6251475	483	0.2737213	0.2712068	374
10	−0.7556651	−0.7612277	+541	+0.6193063	+0.6134211	+497	+0.2686731	+0.2661201	+376
11	0.7667357	0.7721888	535	0.6074921	0.6015201	511	0.2635483	0.2609577	378
12	0.7775865	0.7829285	528	0.5955052	0.5894484	524	0.2583484	0.2557209	380
13	0.7882143	0.7934437	521	0.5833495	0.5772096	538	0.2530750	0.2504113	382
14	0.7986162	0.8037317	514	0.5710286	0.5648074	551	0.2477297	0.2450306	384
15	−0.8087895	−0.8137894	+506	+0.5585459	+0.5522452	+565	+0.2423141	+0.2395805	+386
16	−0.8187314	−0.8236148	+498	+0.5459052	+0.5395268	+578	+0.2368298	+0.2340625	+388

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
Aug. 16	−0.8187314	−0.8236148	+498	+0.5459052	+0.5395268	+578	+0.2368298	+0.2340625	+388
17	0.8284391	0.8332042	490	0.5331101	0.5266559	591	0.2312785	0.2284783	390
18	0.8379100	0.8425560	481	0.5201644	0.5136362	604	0.2256618	0.2228294	391
19	0.8471420	0.8516676	472	0.5070717	0.5004713	617	0.2199812	0.2171174	393
20	0.8561326	0.8605364	462	0.4938353	0.4871644	630	0.2142382	0.2113439	394
21	−0.8648791	−0.8691601	+452	+0.4804588	+0.4737191	+643	+0.2084346	+0.2055105	+396
22	0.8733793	0.8775364	442	0.4669456	0.4601389	655	0.2025717	0.1996186	397
23	0.8816309	0.8856627	432	0.4532993	0.4464274	668	0.1966511	0.1936698	398
24	0.8896314	0.8935366	421	0.4395234	0.4325881	680	0.1906744	0.1876656	399
25	0.8973782	0.9011557	410	0.4256215	0.4186245	692	0.1846432	0.1816077	401
26	−0.9048690	−0.9085176	+399	+0.4115972	+0.4045403	+703	+0.1785591	+0.1754977	+402
27	0.9121014	0.9156199	388	0.3974540	0.3903389	715	0.1724236	0.1693370	403
28	0.9190730	0.9224602	376	0.3831953	0.3760239	726	0.1662380	0.1631271	404
29	0.9257813	0.9290358	364	0.3688251	0.3615995	737	0.1600041	0.1568697	405
30	0.9322236	0.9353443	351	0.3543474	0.3470695	748	0.1537237	0.1505667	406
31	−0.9383976	−0.9413834	+339	+0.3397662	+0.3324380	+759	+0.1473986	+0.1442199	+407
Sept. 1	0.9443013	0.9471510	326	0.3250854	0.3177091	769	0.1410305	0.1378310	408
2	0.9499322	0.9526446	313	0.3103095	0.3028873	780	0.1346212	0.1314018	409
3	0.9552880	0.9578620	299	0.2954430	0.2879771	790	0.1281725	0.1249340	410
4	0.9603666	0.9628014	286	0.2804901	0.2729827	799	0.1216862	0.1184296	411
5	−0.9651662	−0.9674609	+272	+0.2654553	+0.2579086	+809	+0.1151642	+0.1118905	+411
6	0.9696851	0.9718389	258	0.2503431	0.2427594	819	0.1086084	0.1053187	412
7	0.9739218	0.9759339	243	0.2351581	0.2275398	828	0.1020211	0.0987163	412
8	0.9778747	0.9797445	229	0.2199051	0.2122546	837	0.0954042	0.0920853	412
9	0.9815425	0.9832693	214	0.2045888	0.1969085	845	0.0887597	0.0854277	413
10	−0.9849242	−0.9865075	+199	+0.1892140	+0.1815061	+853	+0.0820895	+0.0787455	+413
11	0.9880188	0.9894582	183	0.1737852	0.1660521	861	0.0753957	0.0720407	413
12	0.9908253	0.9921203	168	0.1583071	0.1505511	869	0.0686804	0.0653154	413
13	0.9933428	0.9944931	152	0.1427845	0.1350080	876	0.0619457	0.0585717	413
14	0.9955707	0.9965760	136	0.1272220	0.1194272	883	0.0551936	0.0518116	413
15	−0.9975087	−0.9983690	+120	+0.1116239	+0.1038129	+890	+0.0484260	+0.0450370	+412
16	0.9991566	0.9998717	104	0.0959945	0.0881695	897	0.0416448	0.0382498	412
17	1.0005139	1.0010836	87	0.0803383	0.0725015	903	0.0348520	0.0314519	412
18	1.0015803	1.0020042	70	0.0646596	0.0568132	909	0.0280495	0.0246453	411
19	1.0023553	1.0026334	53	0.0489629	0.0411091	915	0.0212393	0.0178319	410
20	−1.0028386	−1.0029707	+ 36	+0.0332524	+0.0253933	+921	+0.0144232	+0.0110136	+409
21	1.0030298	1.0030158	19	0.0175323	+0.0096699	926	0.0076031	+0.0041921	408
22	1.0029286	1.0027683	+ 2	+0.0018067	−0.0060569	931	+0.0007807	−0.0026307	407
23	1.0025347	1.0022279	− 16	−0.0139202	0.0217827	936	−0.0060420	0.00945 9	406
24	1.0018478	1.0013944	33	0.0296438	0.0375030	941	0.0128632	0.0162726	405
25	−1.0008675	−1.0002674	− 51	−0.0453596	−0.0532133	+945	−0.0196809	−0.0230878	+403
26	0.9995938	0.9988469	69	0.0610632	0.0689092	949	0.0264931	0.0298966	402
27	0.9980266	0.9971328	87	0.0767504	0.0845866	953	0.0332981	0.0366972	400
28	0.9961655	0.9951247	105	0.0924169	0.1002410	956	0.0400940	0.0434878	398
29	0.9940103	0.9928224	123	0.1080580	0.1158674	959	0.0468788	0.0502663	396
30	−0.9915609	−0.9902260	−141	−0.1236685	−0.1314606	+962	−0.0536504	−0.0570305	+394
31	−0.9888176	−0.9873359	−160	−0.1392433	−0.1470158	+961	−0.0604066	−0.0637783	+392

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
Oct. 1	−0.9888176	−0.9873359	− 160	−0.1392433	−0.1470158	+964	−0.0604066	−0.0637783	+392
2	0.9857809	0.9841526	178	0.1547777	0.1625283	966	0.0671454	0.0705076	390
3	0.9824511	0.9806765	197	0.1702670	0.1779932	968	0.0738647	0.0772164	387
4	0.9788289	0.9769084	216	0.1857063	0.1934056	970	0.0805625	0.0839026	385
5	0.9749150	0.9728490	235	0.2010905	0.2087605	971	0.0872365	0.0905639	382
6	−0.9707102	−0.9684992	− 254	−0.2164148	−0.2240530	+972	−0.0938845	−0.0971982	+379
7	0.9662157	0.9638603	273	0.2316743	0.2392782	972	0.1005046	0.1038035	376
8	0.9614328	0.9589339	292	0.2468641	0.2544312	973	0.1070946	0.1103776	373
9	0.9563632	0.9537215	311	0.2619791	0.2695070	973	0.1136522	0.1169183	370
10	0.9510085	0.9482247	330	0.2770145	0.2845009	973	0.1201755	0.1234236	367
11	−0.9453701	−0.9424451	− 349	−0.2919658	−0.2994085	+972	−0.1266625	−0.1298916	+363
12	0.9394497	0.9363845	368	0.3068284	0.3142252	971	0.1331111	0.1363203	360
13	0.9332493	0.9300449	388	0.3215981	0.3289468	970	0.1395193	0.1427077	356
14	0.9267710	0.9234284	407	0.3362707	0.3435692	969	0.1458853	0.1490519	353
15	0.9200169	0.9165371	427	0.3508418	0.3580879	967	0.1522073	0.1553511	349
16	−0.9129889	−0.9093730	− 446	−0.3653070	−0.3724986	+965	−0.1584833	−0.1616034	+345
17	0.9056892	0.9019380	466	0.3796621	0.3867971	963	0.1647114	0.1678070	341
18	0.8981195	0.8942341	485	0.3939032	0.4009797	960	0.1708899	0.1739601	337
19	0.8902819	0.8862634	505	0.4080264	0.4150425	957	0.1770172	0.1800610	332
20	0.8821786	0.8780281	524	0.4220277	0.4289813	954	0.1830914	0.1861080	328
21	−0.8738118	−0.8695302	− 544	−0.4359030	−0.4427920	+951	−0.1891107	−0.1920993	+323
22	0.8651834	0.8607719	564	0.4496482	0.4564707	947	0.1950734	0.1980331	318
23	0.8562956	0.8517552	584	0.4632594	0.4700134	943	0.2009779	0.2039078	313
24	0.8471506	0.8424822	603	0.4767326	0.4834161	939	0.2068224	0.2097216	308
25	0.8377501	0.8329548	623	0.4900636	0.4966746	934	0.2126051	0.2154728	303
26	−0.8280964	−0.8231755	− 643	−0.5032484	−0.5097847	+929	−0.2183244	−0.2211597	+298
27	0.8181923	0.8131471	663	0.5162828	0.5227422	924	0.2239784	0.2267803	292
28	0.8080403	0.8028720	683	0.5291624	0.5355427	919	0.2295652	0.2323328	287
29	0.7976426	0.7923525	703	0.5418828	0.5481819	913	0.2350830	0.2378154	281
30	0.7870019	0.7815914	723	0.5544396	0.5606555	907	0.2405300	0.2432264	275
31	−0.7761213	−0.7705920	− 743	−0.5668289	−0.5729595	+900	-0 2459044	−0.2485639	+269
Nov. 1	0.7650041	0.7593577	763	0.5790467	0.5850899	893	0.2512045	0.2538262	263
2	0.7536533	0.7478913	783	0.5910886	0.5970422	886	0.2564286	0.2590115	257
3	0.7420720	0.7361961	803	0.6029504	0.6088125	878	0.2615747	0.2641180	251
4	0.7302637	0.7242757	822	0.6146281	0.6203968	870	0.2666410	0.2691438	244
5	−0.7182322	−0.7121340	− 842	−0.6261180	-0.6317913	+862	−0.2716259	−0.2740873	+238
6	0.7059813	0.6997749	861	0.6374161	0.6429920	853	0.2765277	0.2789469	231
7	0.6935150	0.6872024	881	0.6485185	0.6539952	844	0.2813448	0.2837211	225
8	0.6808374	0.6744205	900	0.6594217	0.6647976	834	0.2860756	0.2884082	218
9	0.6679524	0.6614335	919	0.6701224	0.6753958	824	0.2907186	0.2930067	211
10	-0.6548643	−0.6482455	− 938	-0.6806173	−0.6857865	+814	−0.2952723	−0.2975152	+204
11	0.6415775	0.6348608	957	0.6909031	0.6959665	804	0.2997351	0.3019321	197
12	0.6280961	0.6212834	976	0.7009766	0.7059329	793	0.3041057	0.3062562	190
13	0.6144238	0.6075174	995	0.7108351	0.7156829	782	0.3083830	0.3104863	183
14	0.6005649	0.5935668	1014	0.7204759	0.7252139	770	0.3125657	0.3146212	175
15	-0.5865237	−0.5794361	−1033	−0.7298964	−0.7345232	+758	-0.3166526	−0.3186598	+167
16	−0.5723045	−0.5651295	−1052	-0.7390939	−0.7436081	+746	−0.3206426	−0.3226010	+159

FOR GREENWICH MEAN NOON AND MIDNIGHT

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
Nov. 16	−0.5723045	−0.5651295	−1052	−0.7390939	−0.7436081	+746	−0.3206426	−0.3226010	+159
17	0.5579115	0.5506511	1071	0.7480655	0.7524658	733	0.3245345	0.3264434	151
18	0.5433486	0.5360048	1089	0.7568085	0.7610935	720	0.3283272	0.3301860	142
19	0.5286197	0.5211945	1107	0.7653203	0.7694888	707	0.3320195	0.3338277	134
20	0.5137292	0.5062246	1125	0.7735984	0.7776490	693	0.3356102	0.3373672	125
21	−0.4986811	−0.4910993	−1143	−0.7816401	−0.7855716	+679	−0.3390983	−0.3408036	+117
22	0.4834796	0.4758226	1161	0.7894429	0.7932540	664	0.3424827	0.3441357	108
23	0.4681287	0.4603986	1179	0.7970043	0.8006937	649	0.3457623	0.3473625	100
24	0.4526329	0.4448320	1196	0.8043217	0.8078881	634	0.3489361	0.3504829	91
25	0.4369967	0.4291272	1214	0.8113925	0.8148346	618	0.3520029	0.3534959	82
26	−0.4212243	−0.4132885	−1231	−0.8182140	−0.8215306	+602	−0.3549617	−0.3564003	+ 73
27	0.4053202	0.3973205	1248	0.8247837	0.8279734	585	0.3578114	0.3591951	64
28	0.3892896	0.3812284	1265	0.8310991	0.8341606	568	0.3605509	0.3618790	55
29	0.3731374	0.3650172	1281	0.8371576	0.8400897	551	0.3631791	0.3644511	46
30	0.3568683	0.3486916	1297	0.8429568	0.8457585	533	0.3656949	0.3669104	37
Dec. 1	−0.3404874	−0.3322567	−1313	−0.8484948	−0.8511651	+515	−0.3680976	−0.3692562	+ 28
2	0.3239999	0.3157181	1328	0.8537696	0.8563075	496	0.3703863	0.3714876	18
3	0.3074113	0.2990810	1344	0.8587792	0.8611838	477	0.3725601	0.3736036	+ 9
4	0.2907272	0.2823511	1359	0.8635216	0.8657921	458	0.3746181	0.3756033	− 1
5	0.2739530	0.2655339	1374	0.8679952	0.8701308	438	0.3765594	0.3774861	11
6	−0.2570941	−0.2486349	−1388	−0.8721985	−0.8741985	+418	−0.3783835	−0.3792514	− 21
7	0.2401564	0.2316598	1402	0.8761302	0.8779939	398	0.3800899	0.3808987	30
8	0.2231453	0.2146139	1416	0.8797891	0.8815160	377	0.3816779	0.3824274	40
9	0.2060660	0.1975026	1429	0.8831742	0.8847638	356	0.3831470	0.3838369	50
10	0.1889239	0.1803313	1442	0.8862846	0.8877366	334	0.3844970	0.3851271	60
11	−0.1717248	−0.1631057	−1455	−0.8891197	−0.8904338	+312	−0.3857274	−0.3862976	− 70
12	0.1544741	0.1458312	1467	0.8916789	0.8928549	290	0.3868379	0.3873481	80
13	0.1371773	0.1285132	1479	0.8939617	0.8949993	267	0.3878283	0.3882784	90
14	0.1198395	0.1111568	1490	0.8959676	0.8968666	244	0.3886984	0.3890883	101
15	0.1024658	0.0937671	1501	0.8976962	0.8984564	221	0.3894480	0.3897776	111
16	−0.0850614	−0.0763492	−1511	−0.8991470	−0.8997682	+197	−0.3900770	−0.3903462	−122
17	0.0676313	0.0589082	1521	0.9003197	0.9008017	173	0.3905852	0.3907940	132
18	0.0501805	0.0414491	1531	0.9012140	0.9015566	148	0.3909725	0.3911208	143
19	0.0327142	0.0239768	1541	0.9018296	0.9020327	123	0.3912389	0.3913267	154
20	−0.0152373	−0.0064965	1550	0.9021663	0.9022298	97	0.3913843	0.3914116	165
21	+0.0022452	+0.0109868	−1559	−0.9022237	−0.9021475	+ 72	−0.3914086	−0.3913753	−176
22	0.0197280	0.0284677	1567	0.9020015	0.9017855	46	0.3913116	0.3912177	187
23	0.0372058	0.0459412	1574	0.9014995	0.9011436	+ 20	0.3910933	0.3909388	197
24	0.0546736	0.0634021	1581	0.9007175	0.9002217	− 7	0.3907538	0.3905386	208
25	0.0721262	0.0808450	1588	0.8996556	0.8990197	33	0.3902929	0.3900170	218
26	+0.0895579	+0.0982641	−1594	−0.8983137	−0.8975376	− 60	−0.3897106	−0.3893740	−229
27	0.1069630	0.1156539	1599	0.8966916	0.8957756	87	0.3890069	0.3886096	240
28	0.1243360	0.1330089	1604	0.8947895	0.8937337	114	0.3881819	0.3877240	251
29	0.1416717	0.1503238	1608	0.8926078	0.8914124	141	0.3872358	0.3867175	262
30	0.1589646	0.1675931	1611	0.8901471	0.8888123	169	0.3861689	0.3855902	273
31	+0.1762089	+0.1848109	−1614	−0.8874078	−0.8859340	−196	−0.3849812	−0.3843422	−284
32	+0.1933986	+0.2019712	−1617	−0.8843907	−0.8827783	−223	−0.3836730	−0.3829739	−295

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Day of Month.	JANUARY. True Longitude.	JANUARY. Latitude.	Day of Month.	FEBRUARY. True Longitude.	FEBRUARY. Latitude.	Day of Month.	MARCH. True Longitude.	MARCH. Latitude.
1.0	126° 46′ 52.4″	−0° 16′ 41.3″	1.0	178° 12′ 14.1″	+3° 57′ 51.3″	1.0	202° 35′ 1.9″	+4° 58′ 46.0″
1.5	133 30 8.5	+0 20 9.3	1.5	185 21 53.5	4 22 7.6	1.5	209 57 21.6	5 7 45.4
2.0	140 16 10.4	0 56 59.6	2.0	192 31 48.5	4 42 18.6	2.0	217 17 22.7	5 11 39.1
2.5	147 4 50.5	1 33 17.0	2.5	199 41 30.6	4 58 5.0	2.5	224 34 21.9	5 10 28.7
3.0	153 56 1.5	2 8 28.2	3.0	206 50 33.8	5 9 12.1	3.0	231 47 44.2	5 4 22.4
3.5	160 49 36.6	+2 42 0.4	3.5	213 58 34.9	+5 15 31.2	3.5	238 57 2.7	+4 53 34.2
4.0	167 45 29.1	3 13 21.5	4.0	221 5 13.5	5 16 58.8	4.0	246 1 58.5	4 38 22.5
4.5	174 43 32.5	3 42 0.9	4.5	228 10 12.1	5 13 37.0	4.5	253 2 20.9	4 19 9.6
5.0	181 43 39.5	4 7 30.1	5.0	235 13 15.6	5 5 32.3	5.0	259 58 6.0	3 56 20.6
5.5	188 45 42.1	4 29 23.0	5.5	242 14 11.2	4 52 55.9	5.5	266 49 15.3	3 30 22.3
6.0	195 49 30.3	+4 47 16.7	6.0	249 12 48.0	+4 36 3.3	6.0	273 35 55.4	+3 1 42.9
6.5	202 54 52.2	5 0 51.7	6.5	256 8 56.6	4 15 14.0	6.5	280 18 16.2	2 30 51.1
7.0	210 1 33.2	5 9 52.7	7.0	263 2 28.8	3 50 50.1	7.0	286 56 30.1	1 58 15.8
7.5	217 9 15.7	5 14 9.0	7.5	269 53 16.9	3 23 16.9	7.5	293 30 50.7	1 24 25.8
8.0	224 17 38.8	5 13 34.6	8.0	276 41 14.2	2 53 2.2	8.0	300 1 32.3	0 49 49.5
8.5	231 26 18.4	+5 8 8.8	8.5	283 26 14.1	+2 20 35.1	8.5	306 28 48.9	+0 14 54.2
9.0	238 34 46.9	4 57 56.8	9.0	290 8 10.5	1 46 26.3	9.0	312 52 53.8	−0 19 53.3
9.5	245 42 34.5	4 43 8.9	9.5	296 46 57.7	1 11 6.7	9.5	319 13 59.4	0 54 7.5
10.0	252 49 9.2	4 24 1.1	10.0	303 22 30.3	+0 35 7.4	10.0	325 32 16.6	1 27 24.1
10.5	259 53 58.0	4 0 54.5	10.5	309 54 43.8	−0 1 0.9	10.5	331 47 55.2	1 59 20.7
11.0	266 56 27.8	+3 34 14.7	11.0	316 23 34.9	−0 36 49.1	11.0	338 1 4.1	−2 29 36.4
11.5	273 56 6.2	3 4 31.2	11.5	322 49 1.5	1 11 49.3	11.5	344 11 51.0	2 57 52.0
12.0	280 52 23.4	2 32 16.2	12.0	329 11 3.2	1 45 35.7	12.0	350 20 23.2	3 23 50.6
12.5	287 44 52.5	1 58 4.0	12.5	335 29 41.6	2 17 44.8	12.5	356 26 47.8	3 47 17.2
13.0	294 33 10.7	1 22 29.5	13.0	341 45 0.6	2 47 56.1	13.0	2 31 12.0	4 7 59.1
13.5	301 16 59.7	+0 46 7.5	13.5	347 57 6.9	−3 15 51.2	13.5	8 33 44.2	−4 25 45.6
14.0	307 56 6.6	+0 9 31.3	14.0	354 6 9.5	3 41 14.6	14.0	14 34 33.4	4 40 28.4
14.5	314 30 24.1	−0 26 47.3	14.5	0 12 20.7	4 3 53.3	14.5	20 33 50.3	4 52 1.0
15.0	320 59 50.5	1 2 19.3	15.0	6 15 55.7	4 23 36.7	15.0	26 31 47.6	5 0 18.8
15.5	327 24 29.6	1 36 38.2	15.5	12 17 12.4	4 40 16.3	15.5	32 28 40.0	5 5 19.0
16.0	333 44 30.5	−2 9 21.2	16.0	18 16 31.6	−4 53 45.9	16.0	38 24 44.9	−5 7 0.5
16.5	340 0 7.3	2 40 8.0	16.5	24 14 17.3	5 4 0.4	16.5	44 20 22.1	5 5 23.6
17.0	346 11 38.4	3 8 41.6	17.0	30 10 55.8	5 10 56.6	17.0	50 15 54.1	5 0 29.8
17.5	352 19 26.6	3 34 47.5	17.5	36 6 56.0	5 14 32.3	17.5	56 11 46.3	4 52 21.8
18.0	358 23 58.0	3 58 13.7	18.0	42 2 48.7	5 14 46.5	18.0	62 8 26.8	4 41 3.2
18.5	4 25 41.6	−4 18 50.2	18.5	47 59 6.6	−5 11 38.8	18.5	68 6 26.0	−4 26 38.7
19.0	10 25 8.9	4 36 28.8	19.0	53 56 23.9	5 5 9.7	19.0	74 6 16.5	4 9 14.0
19.5	16 22 53.1	4 51 2.8	19.5	59 55 16.1	4 55 20.7	19.5	80 8 32.9	3 48 55.7
20.0	22 19 29.1	5 2 26.5	20.0	65 56 19.0	4 42 13.9	20.0	86 13 51.3	3 25 51.7
20.5	28 15 32.5	5 10 35.4	20.5	72 0 8.5	4 25 52.7	20.5	92 22 48.9	3 0 11.4
21.0	34 11 39.3	−5 15 25.6	21.0	78 7 20.2	−4 6 21.6	21.0	98 36 2.8	−2 32 5.6
21.5	40 8 25.6	5 16 53.8	21.5	84 18 28.5	3 43 46.8	21.5	104 54 9.7	2 1 47.8
22.0	46 6 26.7	5 14 57.8	22.0	90 34 5.9	3 18 16.2	22.0	111 17 44.6	1 29 33.1
22.5	52 6 16.9	5 9 35.8	22.5	96 54 42.2	2 50 0.4	22.5	117 47 20.0	0 55 40.0
23.0	58 8 29.3	5 0 47.1	23.0	103 20 43.8	2 19 12.6	23.0	124 23 24.3	−0 20 30.1
23.5	64 13 34.7	−4 48 32.1	23.5	109 52 32.1	−1 46 9.5	23.5	131 6 20.3	+0 15 31.4
24.0	70 22 1.5	4 32 52.8	24.0	116 30 23.1	1 11 11.6	24.0	137 56 23.6	0 51 55.5
24.5	76 34 14.9	4 13 52.7	24.5	123 14 26.4	−0 34 43.2	24.5	144 53 41.0	1 28 9.3
25.0	82 50 36.8	3 51 38.1	25.0	130 4 43.4	+0 2 47.0	25.0	151 58 8.7	2 3 36.8
25.5	89 11 24.8	3 26 17.2	25.5	137 1 7.5	0 40 46.3	25.5	159 9 31.4	2 37 38.8
26.0	95 36 52.2	−2 58 2.0	26.0	144 3 23.0	+1 18 38.5	26.0	166 27 21.1	+3 9 34.4
26.5	102 7 7.4	2 27 7.6	26.5	151 11 4.8	1 55 44.3	26.5	173 50 56.7	3 38 42.5
27.0	108 42 13.5	1 53 52.9	27.0	158 23 39.1	2 31 22.6	27.0	181 19 24.4	4 4 23.5
27.5	115 22 8.6	1 18 40.7	27.5	165 40 23.3	3 4 52.0	27.5	188 51 39.6	4 26 1.1
28.0	122 6 45.1	0 41 57.8	28.0	173 0 27.7	3 35 32.1	28.0	196 26 28.6	4 43 4.4
28.5	128 55 50.2	−0 4 14.5	28.5	180 22 57.0	4 2 45.6	28.5	204 2 32.0	4 55 9.6
29.0	135 49 6.2	+0 33 55.7	29.0	187 46 52.4	+4 25 59.4	29.0	211 38 27.9	+5 2 1.4
29.5	142 46 11.1	1 11 56.6	29.5	195 11 13.6	4 44 46.4	29.5	219 12 56.0	5 3 33.4
30.0	149 46 38.9	1 49 10.6	30.0	202 35 1.9	4 58 46.0	30.0	226 44 41.3	4 59 48.4
30.5	156 50 0.7	2 24 59.7	30.5	209 57 21.6	5 7 45.4	30.5	234 12 37.4	4 50 57.5
31.0	163 55 45.4	2 58 46.2	31.0	217 17 22.7	5 11 39.1	31.0	241 35 48.3	4 37 19.4
31.5	171 3 20.8	+3 29 54.4	31.5	224 34 21.9	+5 10 28.7	31.5	248 53 30.0	+4 19 18.5

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Day of Month.	APRIL. True Longitude.	Latitude.	Day of Month.	MAY. True Longitude.	Latitude.	Day of Month.	JUNE. True Longitude.	Latitude.
1.0	256° 5′ 11.″7	+3° 57′ 23.″5	1.0	293° 14′ 1.″5	+0° 58′ 18.″8	1.0	340° 55′ 52.″4	−3° 14′ 35.″1
1.5	263 10 34.7	3 32 5.9	1.5	299 57 9.9	+0 23 6.7	1.5	347 7 48.5	3 39 13.4
2.0	270 9 31.9	3 3 58.7	2.0	306 33 42.0	−0 11 50.7	2.0	353 15 48.7	4 1 3.8
2.5	277 2 6.0	2 33 34.9	2.5	313 4 4.9	0 46 6.7	2.5	359 20 28.3	4 19 57.9
3.0	283 48 27.7	2 1 27.1	3.0	319 28 49.4	1 19 17.7	3.0	5 22 21.4	4 35 49.1
3.5	290 28 54.6	+1 28 6.5	3.5	325 48 28.3	−1 51 3.0	3.5	11 22 0.8	−4 48 32.1
4.0	297 3 48.8	0 54 2.6	4.0	332 3 35.7	2 21 4.2	4.0	17 19 57.8	4 58 2.6
4.5	303 33 35.5	+0 19 43.3	4.5	338 14 45.5	2 49 5.1	4.5	23 16 41.8	5 4 17.7
5.0	309 58 41.6	−0 14 25.4	5.0	344 22 30.4	3 14 51.5	5.0	29 12 39.2	5 7 15.6
5.5	316 19 34.9	0 47 59.4	5.5	350 27 21.7	3 38 11.0	5.5	35 8 14.8	5 6 55.1
6.0	322 36 42.5	−1 20 36.5	6.0	356 29 48.7	−3 58 52.6	6.0	41 3 50.4	−5 3 16.5
6.5	328 50 30.3	1 51 56.0	6.5	2 30 18.2	4 16 46.8	6.5	46 59 46.2	4 56 21.6
7.0	335 1 22.7	2 21 39.1	7.0	8 29 14.5	4 31 45.5	7.0	52 56 19.6	4 46 13.4
7.5	341 9 41.9	2 49 28.3	7.5	14 26 59.2	4 43 41.7	7.5	58 53 45.9	4 32 56.4
8.0	347 15 47.8	3 15 7.8	8.0	20 23 51.6	4 52 30.1	8.0	64 52 19.2	4 16 36.7
8.5	353 19 58.0	−3 38 23.5	8.5	26 20 8.5	−4 58 6.5	8.5	70 52 11.9	−3 57 22.4
9.0	359 22 27.9	3 59 2.9	9.0	32 16 4.6	5 0 28.3	9.0	76 53 35.2	3 35 23.2
9.5	5 23 30.9	4 16 55.0	9.5	38 11 52.9	4 59 34.5	9.5	82 56 39.8	3 10 50.7
10.0	11 23 18.7	4 31 50.6	10.0	44 7 45.1	4 55 25.6	10.0	89 1 35.9	2 43 58.5
10.5	17 22 1.8	4 43 42.3	10.5	50 3 51.9	4 48 3.7	10.5	95 8 34.0	2 15 2.0
11.0	23 19 49.7	−4 52 24.5	11.0	56 0 23.8	−4 37 32.6	11.0	101 17 45.1	−1 44 18.4
11.5	29 16 51.9	4 57 53.1	11.5	61 57 31.2	4 23 57.8	11.5	107 29 20.5	1 12 6.6
12.0	35 13 17.9	5 0 6.3	12.0	67 55 25.1	4 7 26.3	12.0	113 43 33.0	0 38 47.3
12.5	41 9 18.0	4 59 3.4	12.5	73 54 17.4	3 48 6.9	12.5	120 0 36.1	−0 4 42.3
13.0	47 5 3.6	4 54 15.8	13.0	79 54 21.9	3 26 9.9	13.0	126 20 44.8	+0 29 44.9
13.5	53 0 47.7	−4 47 16.3	13.5	85 55 53.9	−3 1 47.1	13.5	132 44 15.1	+1 4 9.5
14.0	58 56 45.4	4 36 39.1	14.0	91 59 10.7	2 35 11.8	14.0	139 11 23.8	1 38 5.9
14.5	64 53 14.2	4 23 0.0	14.5	98 4 32.0	2 6 38.8	14.5	145 42 28.4	2 11 7.4
15.0	70 50 34.2	4 6 25.9	15.0	104 12 20.0	1 36 24.2	15.0	152 17 46.0	2 42 46.7
15.5	76 49 8.1	3 47 4.9	15.5	110 22 58.8	1 4 45.3	15.5	158 57 33.2	3 12 35.8
16.0	82 49 21.3	−3 25 6.3	16.0	116 36 55.0	−0 32 1.1	16.0	165 42 4.5	+3 40 6.1
16.5	88 51 42.1	3 0 40.8	16.5	122 54 36.6	+0 1 27.9	16.5	172 31 32.0	4 4 50.5
17.0	94 56 41.4	2 34 0.2	17.0	129 16 32.8	0 35 19.7	17.0	179 26 3.7	4 26 20.3
17.5	101 4 52.1	2 5 17.7	17.5	135 43 13.1	1 9 10.6	17.5	186 25 42.5	4 44 9.3
18.0	107 16 48.6	1 34 47.9	18.0	142 15 6.5	1 42 35.2	18.0	193 30 24.9	4 57.52.9
18.5	113 33 6.6	−1 2 47.1	18.5	148 52 40.4	+2 15 6.3	18.5	200 40 0.4	+5 7 9.2
19.0	119 54 22.3	−0 29 34.7	19.0	155 36 18.9	2 46 11.9	19.0	207 54 9.8	5 11 39.9
19.5	126 21 10.7	+0 4 20.5	19.5	162 26 21.6	3 15 30.6	19.5	215 12 25.3	5 11 11.7
20.0	132 54 5.0	0 39 1.8	20.0	169 23 1.6	3 42 21.8	20.0	222 34 10.1	5 5 36.9
20.5	139 33 35.0	1 13 36.0	20.5	176 26 23.9	4 6 16.1	20.5	229 58 39.2	4 54 54.8
21.0	146 20 5.3	+1 47 43.1	21.0	183 36 23.7	+4 26 41.7	21.0	237 25 0.0	+4 39 12.4
21.5	153 13 53.7	2 20 51.2	21.5	190 52 44.6	4 43 8.0	21.5	244 52 14.1	4 18 43.9
22.0	160 15 8.8	2 52 25.9	22.0	198 14 57.5	4 55 7.1	22.0	252 19 19.6	3 53 51.4
22.5	167 23 48.3	3 21 50.6	22.5	205 42 21.0	5 2 15.6	22.5	259 45 13.4	3 25 4.0
23.0	174 39 37.6	3 45 28.0	23.0	213 14 1.0	5 4 15.9	23.0	267 8 53.4	2 52 56.7
23.5	182 2 7.8	+4 11 40.9	23.5	220 48 51.5	+5 0 57.7	23.5	274 29 21.2	+2 18 9.4
24.0	189 30 35.6	4 30 54.0	24.0	228 25 38.2	4 52 19.6	24.0	281 45 44.2	1 41 23.5
24.5	197 4 3.7	4 45 35.9	24.5	236 3 0.7	4 38 28.8	24.5	288 57 17.4	1 3 22.1
25.0	204 41 21.9	4 55 20.9	25.0	243 39 36.5	4 19 42.2	25.0	295 3 24.5	+0 24 48.1
25.5	212 21 9.7	4 59 54.0	25.5	251 14 4.2	3 56 24.9	25.5	303 3 38.3	−0 13 38.3
26.0	220 1 59.5	+4 58 57.0	26.0	258 45 8.1	+3 29 9.2	26.0	309 57 41.4	−0 51 20.3
26.5	227 42 21.4	4 52 39.4	26.5	266 11 40.5	2 58 32.9	26.5	316 45 25.5	1 27 45.1
27.0	235 20 47.0	4 41 8.3	27.0	273 32 44.8	2 25 17.2	27.0	323 26 50.6	2 2 24.2
27.5	242 55 53.5	4 24 13.0	27.5	280 47 36.3	1 50 4.8	27.5	330 2 4.7	2 34 53.5
28.0	250 26 27.9	4 3 50.2	28.0	287 55 43.5	1 13 37.9	28.0	336 31 22.5	3 4 53.2
28.5	257 51 29.4	3 39 2.7	28.5	294 56 47.6	+0 36 36.7	28.5	342 55 4.6	3 32 7.7
29.0	265 10 10.7	+3 10 57.0	29.0	301 50 41.6	−0 0 21.5	29.0	349 13 35.8	−3 56 24.7
29.5	272 21 59.1	2 40 11.6	29.5	308 37 28.9	0 36 43.4	29.5	355 27 24.4	4 17 34 8
30.0	279 26 35.9	2 7 20.4	30.0	315 17 22.2	1 11 59.6	30.0	1 37 1.7	4 35 31.3
30.5	286 23 54.9	1 33 16.0	30.5	321 50 41.5	1 45 44.7	30.5	7 43 0.6	4 50 9.3
31.0	293 14 1.5	0 58 18.8	31.0	328 17 52.5	2 17 37.1	31.0	13 45 55.1	5 1 25.8
31.5	299 57 9.9	+0 23 6.7	31.5	334 39 25.3	−2 47 18.9	31.5	19 46 19.5	−5 9 19.0

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Day of Month.	JULY. True Longitude.	JULY. Latitude.	Day of Month.	AUGUST. True Longitude.	AUGUST. Latitude.	Day of Month.	SEPTEMBER. True Longitude.	SEPTEMBER. Latitude.
1.0	13° 45′ 55.″1	−5° 1′ 25.″8	1.0	57° 34′ 42.″9	−4° 42′ 2.″5	1.0	101° 43′ 21.″8	−1° 37′ 13.″9
1.5	19 46 19.5	5 9 19.0	1.5	63 32 3.2	4 25 35.2	1.5	107 57 46.5	1 4 28.4
2.0	25 44 48.1	5 13 48.3	2.0	69 30 41.0	4 6 11.3	2.0	114 16 59.2	−0 30 31.9
2.5	31 41 54.5	5 14 54.0	2.5	75 31 16.7	3 43 59.3	2.5	120 41 23.6	+0 4 13.6
3.0	37 38 11.2	5 12 37.1	3.0	81 34 10.8	3 19 9.0	3.0	127 11 17.8	0 39 23.4
3.5	43 34 9.3	−5 6 59.9	3.5	87 39 53.6	−2 51 52.1	3.5	133 46 54.1	+1 14 30.1
4.0	49 30 18.2	4 58 5.3	4.0	93 48 49.5	2 22 22.0	4.0	140 28 17.7	1 49 3.8
4.5	55 27 5.5	4 45 57.3	4.5	100 1 19.8	1 50 54.4	4.5	147 15 26.1	2 22 32.3
5.0	61 24 56.7	4 30 41.2	5.0	106 17 42.5	1 17 47.9	5.0	154 8 8.8	2 54 21.7
5.5	67 24 14.9	4 12 23.7	5.5	112 38 11.6	0 43 23.1	5.5	161 6 7.0	3 23 57.7
6.0	73 25 20.9	−3 51 12.8	6.0	119 2 57.3	−0 8 2.9	6.0	168 8 54.0	+3 50 46.2
6.5	79 28 33.0	3 27 18.6	6.5	125 32 5.3	+0 27 46.5	6.5	175 15 55.4	4 14 14.8
7.0	85 34 7.5	3 0 53.1	7.0	132 5 36.9	1 3 37.0	7.0	182 26 30.4	4 33 53.8
7.5	91 42 18.1	2 32 10.4	7.5	138 43 28.9	1 38 58.3	7.5	189 39 53.5	4 49 18.0
8.0	97 53 16.4	2 1 26.6	8.0	145 25 33.9	2 13 19.3	8.0	196 55 15.9	5 0 7.1
8.5	104 7 11.9	−1 29 0.3	8.5	152 11 40.3	+2 46 7.1	8.5	204 11 47.3	+5 6 7.1
9.0	110 24 12.5	0 55 12.3	9.0	159 1 32.7	3 16 49.7	9.0	211 28 38.4	5 7 10.5
9.5	116 44 24.1	−0 20 25.4	9.5	165 54 52.7	3 44 55.6	9.5	218 45 2.4	5 3 16.4
10.0	123 7 51.6	+0 14 55.6	10.0	172 51 19.1	4 9 54.8	10.0	226 0 17.3	4 54 30.8
10.5	129 34 38.4	0 50 24.2	10.5	179 50 28.8	4 31 20.2	10.5	233 13 46.1	4 41 5.5
11.0	136 4 47.1	+1 25 32.6	11.0	186 51 57.3	+4 48 48.0	11.0	240 24 58.2	+4 23 17.9
11.5	142 38 19.3	1 59 52.0	11.5	193 55 19.6	5 1 58.2	11.5	247 33 30.0	4 1 29.9
12.0	149 15 16.1	2 32 53.1	12.0	201 0 11.0	5 10 35.5	12.0	254 39 4.0	3 36 7.1
12.5	155 55 38.1	3 4 6.6	12.5	208 6 7.2	5 14 29.5	12.5	261 41 28.6	3 7 37.9
13.0	162 39 24.8	3 33 3.4	13.0	215 12 45.1	5 13 34.9	13.0	268 40 37.8	2 36 32.6
13.5	169 26 35.2	+3 59 15.6	13.5	222 19 43.1	+5 7 51.7	13.5	275 36 29.3	+2 3 23.0
14.0	176 17 7.3	4 22 16.5	14.0	229 26 41.2	4 57 25.1	14.0	282 29 4.5	1 28 41.7
14.5	183 10 57.7	4 41 41.5	14.5	236 33 20.7	4 42 25.0	14.5	289 18 26.6	0 53 0.8
15.0	190 8 1.3	4 57 8.5	15.0	243 39 24.4	4 23 6.4	15.0	296 4 40.4	+0 16 52.4
15.5	197 8 10 8	5 8 18.2	15.5	250 44 36.3	3 59 48.7	15.5	302 47 50.8	−0 19 12.1
16.0	204 11 16.2	+5 14 54.9	16.0	257 48 41.4	+3 32 55.4	16.0	309 28 2.4	−0 54 42.7
16.5	211 17 4.7	5 16 47.1	16.5	264 51 24.9	3 2 53.4	16.5	316 5 19.0	1 29 10.9
17.0	218 25 20.0	5 13 47.8	17.0	271 52 32.4	2 30 12.7	17.0	322 39 43.6	2 2 10.2
17.5	225 35 42.1	5 5 55.1	17.5	278 51 49.5	1 55 25.8	17.5	329 11 17.6	2 33 15.9
18.0	232 47 47.1	4 53 12.6	18.0	285 49 1.7	1 19 6.8	18.0	335 40 1.3	3 2 6.0
18.5	240 1 7.2	+4 35 49.6	18.5	292 43 54.0	+0 41 50.9	18.5	342 5 54.3	−3 28 21.3
19.0	247 15 11.3	4 14 1.5	19.0	299 36 11.6	+0 4 13.6	19.0	348 28 55.4	3 51 45.2
19.5	254 29 25.3	3 48 9.4	19.5	306 25 39.6	−0 33 10.4	19.5	354 49 3.6	4 12 4.1
20.0	261 43 12.5	3 18 39.8	20.0	313 12 3.5	1 9 47.6	20.0	1 6 18.3	4 29 7.5
20.5	268 55 54.6	2 46 4.1	20.5	319 55 9.5	1 45 6.7	20.5	7 20 39.8	4 42 48.0
21.0	276 6 53.1	+2 10 57.7	21.0	326 34 45.0	−2 18 38.8	21.0	13 32 10.3	−4 53 0.7
21.5	283 15 30.1	1 33 58.7	21.5	333 10 39.7	2 49 58.6	21.5	19 40 53.9	4 59 43.4
22.0	290 21 9.4	0 55 47.0	22.0	339 42 45.0	3 18 44.0	22.0	25 46 57.2	5 2 56.4
22.5	297 23 17.5	+0 17 2.6	22.5	346 10 55.8	3 44 36.4	22.5	31 50 29.8	5 2 42.3
23.0	304 21 25.1	−0 21 35.2	23.0	352 35 9.8	4 7 21.4	23.0	37 51 44.5	4 59 5.3
23.5	311 15 7.1	−0 59 29.5	23.5	358 55 28.1	−4 26 47.8	23.5	43 50 57.3	−4 52 11.3
24.0	318 4 4.0	1 36 6.1	24.0	5 11 55.9	4 42 47.8	24.0	49 48 27.6	4 42 7.5
24.5	324 48 1.7	2 10 54.7	24.5	11 24 42.4	4 55 16.8	24.5	55 44 38.3	4 29 2.1
25.0	331 26 52.3	2 43 29.3	25.0	17 34 0.3	5 4 12.6	25.0	61 39 55.7	4 13 4.1
25.5	338 0 33.6	3 13 27.9	25.5	23 40 6.7	5 9 35.5	25.5	67 34 48.6	3 54 23.4
26.0	344 29 9.0	−3 40 32.7	26.0	29 43 21.8	−5 11 27.5	26.0	73 29 49.4	−3 33 10.4
26.5	350 52 47.4	4 4 30.0	26.5	35 44 9.7	5 9 52.3	26.5	79 25 32.7	3 9 36.1
27.0	357 11 42.9	4 25 9.9	27.0	41 42 57.1	5 4 54.8	27.0	85 22 35.3	2 43 52.5
27.5	3 26 14.1	4 42 25.2	27.5	47 40 13.8	4 56 40.6	27.5	91 21 35.5	2 16 11.9
28.0	9 36 43.3	4 56 11.7	28.0	53 36 31.9	4 45 16.5	28.0	97 23 13.3	1 46 47.9
28.5	15 43 36.4	5 6 27.5	28.5	59 32 25.7	4 30 49.6	28.5	103 28 8.8	1 15 55.2
29.0	21 47 22.1	−5 13 12.2	29.0	65 28 30.6	−4 13 27.8	29.0	109 37 1.9	−0 43 50.2
29.5	27 48 31.3	5 16 26.9	29.5	71 25 23.4	3 53 19.9	29.5	115 50 31.6	−0 10 50.8
30.0	33 47 36.6	5 16 14.0	30.0	77 23 41.6	3 30 35.0	30.0	122 9 15.0	+0 22 43.0
30.5	39 45 11.8	5 12 36.8	30.5	83 24 2.2	3 5 23.7	30.5	128 33 45.7	0 56 28.7
31.0	45 41 51.5	5 5 39.2	31.0	89 27 2.2	2 37 57.4	31.0	135 4 32.8	1 30 1.2
31.5	51 38 10.2	−4 55 26.0	31.5	95 33 17.5	−2 8 29.2	31.5	141 41 59.4	+2 2 53.2

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Day of Month.	OCTOBER. True Longitude.	Latitude.	Day of Month.	NOVEMBER. True Longitude.	Latitude.	Day of Month.	DECEMBER. True Longitude.	Latitude.
	° ′ ″	° ′ ″		° ′ ″	° ′ ″		° ′ ″	° ′ ″
1.0	135 4 32.8	+1 30 1.2	1.0	184 33 58.7	+4 43 42.6	1.0	222 26 40.8	+4 49 57.2
1.5	141 41 59.4	2 2 53.2	1.5	191 53 5.9	4 54 27.3	1.5	230 1 32.3	4 33 12.4
2.0	148 26 21.0	2 34 34.3	2.0	199 18 19.6	5 0 24.7	2.0	237 39 5.7	4 11 30.2
2.5	155 17 44.3	3 4 32.6	2.5	206 48 42.6	5 1 17.0	2.5	245 18 0.2	3 45 12.8
3.0	162 16 5.8	3 32 14.5	3.0	214 23 5.4	4 56 53.4	3.0	252 56 52.2	3 14 51.0
3.5	169 21 10.1	+3 57 5.6	3.5	222 0 9.8	+4 47 12.2	3.5	260 34 19.0	+2 41 3.5
4.0	176 32 30.2	4 18 32.3	4.0	229 38 31.4	4 32 21.1	4.0	268 9 2.4	2 4 34.1
4.5	183 49 27.0	4 36 3.0	4.5	237 16 44.0	4 12 36.7	4.5	275 39 51.4	1 26 10.3
5.0	191 11 10.2	4 49 10.2	5.0	244 53 23.9	3 48 24.6	5.0	283 5 44.8	0 46 40.5
5.5	198 36 39.6	4 57 31.4	5.5	252 27 13.5	3 20 17.9	5.5	290 25 53.7	+0 6 51.7
6.0	206 4 47.6	+5 0 51.1	6.0	259 57 4.5	+2 48 54.8	6.0	297 39 41.5	−0 32 31.6
6.5	213 34 22.7	4 59 1.4	6.5	267 22 0.3	2 14 57.0	6.5	304 46 43.7	1 10 49.4
7.0	221 4 11.7	4 52 2.8	7.0	274 41 17.0	1 39 7.8	7.0	311 46 47.9	1 47 26.6
7.5	228 33 3.9	4 40 4.2	7.5	281 54 24.1	1 2 9.8	7.5	318 39 52.4	2 21 53.9
8.0	235 59 53.5	4 23 21.9	8.0	289 1 3.5	+0 24 43.8	8.0	325 26 4.8	2 53 47.0
8.5	243 23 43.1	+4 2 19.6	8.5	296 1 8.9	−0 12 32.2	8.5	332 5 39.9	−3 22 46.6
9.0	250 43 44.7	3 37 25.9	9.0	302 54 43.6	0 49 3.9	9.0	338 38 58.5	3 48 38.3
9.5	257 59 21.0	3 9 13.7	9.5	309 41 58.9	1 24 21.0	9.5	345 6 26.5	4 11 11.2
10.0	265 10 5.8	2 38 17.9	10.0	316 23 12.7	1 57 57.3	10.0	351 28 32.3	4 30 17.8
10.5	272 15 43.1	2 5 14.8	10.5	322 58 47.4	2 29 30.0	10.5	357 45 46.5	4 45 53.4
11.0	279 16 6.4	+1 30 40.7	11.0	329 29 8.1	−2 58 40.0	11.0	3 58 40.7	−4 57 55.6
11.5	286 11 17.2	0 55 10.6	11.5	335 54 41.5	3 25 11.3	11.5	10 7 46.5	5 6 23.7
12.0	293 1 23.5	+0 19 18.1	12.0	342 15 55.0	3 48 50.8	12.0	16 13 35.0	5 11 18.5
12.5	299 46 38.1	−0 16 25.2	12.5	348 33 15.7	4 9 27.8	12.5	22 16 36.1	5 12 42.4
13.0	306 27 17.1	0 51 30.1	13.0	354 47 9.4	4 26 53.8	13.0	28 17 18.6	5 10 38.8
13.5	313 3 38.8	−1 25 29.5	13.5	0 58 0.3	−4 41 2.4	13.5	34 16 9.3	−5 5 12.1
14.0	319 36 2.1	1 57 59.1	14.0	7 6 10.8	4 51 49.1	14.0	40 13 33.1	4 56 28.0
14.5	326 4 45.7	2 28 36.7	14.5	13 12 0.9	4 59 11.2	14.5	46 9 52.7	4 44 33.5
15.0	332 30 7.3	2 57 2.6	15.0	19 15 48.8	5 3 7.6	15.0	52 5 29.2	4 29 36.4
15.5	338 52 23.2	3 22 59.5	15.5	25 17 50.4	5 3 39.0	15.5	58 0 41.8	4 11 45.9
16.0	345 11 47.7	−3 46 12.3	16.0	31 18 19.7	−5 0 47.5	16.0	63 55 47.9	−3 51 12.5
16.5	351 28 33.2	4 6 28.3	16.5	37 17 29.5	4 54 37.2	16.5	69 51 3.4	3 28 8.2
17.0	357 42 50.2	4 23 36.9	17.0	43 15 30.8	4 45 13.6	17.0	75 46 43.1	3 2 46.1
17.5	3 54 47.1	4 37 30.1	17.5	49 12 34.4	4 32 43.9	17.5	81 43 0.7	2 35 20.8
18.0	10 4 31.0	4 48 2.0	18.0	55 8 50.7	4 17 16.9	18.0	87 40 9.8	2 6 8.2
18.5	16 12 7.9	−4 55 9.2	18.5	61 4 30.3	−3 59 2.6	18.5	93 38 23.4	−1 35 25.5
19.0	22 17 43.3	4 58 50.5	19.0	66 59 44.3	3 38 12.8	19.0	99 37 54.7	1 3 31.1
19.5	28 21 22.8	4 59 6.6	19.5	72 54 44.9	3 15 0.0	19.5	105 38 57.4	−0 30 44.4
20.0	34 23 12.3	4 56 0.5	20.0	78 49 45.8	2 49 38.3	20.0	111 41 45.9	+0 2 34.3
20.5	40 23 19.0	4 49 37.0	20.5	84 45 2.7	2 22 22.8	20.5	117 46 35.3	0 36 3.9
21.0	46 21 51.9	−4 40 2.8	21.0	90 40 53.3	−1 53 29.2	21.0	123 53 42.2	+1 9 22.4
21.5	52 19 1.6	4 27 25.9	21.5	96 37 37.5	1 23 14.4	21.5	130 3 24.2	1 42 7.6
22.0	58 15 1.3	4 11 55.6	22.0	102 35 37.8	0 51 55.7	22.0	136 16 0.2	2 13 56.7
22.5	64 10 7.1	3 53 42.6	22.5	108 35 19.1	−0 19 51.1	22.5	142 31 50.4	2 44 26.6
23.0	70 4 37.9	3 32 58.6	23.0	114 37 9.0	+0 12 40.6	23.0	148 51 15.9	3 13 14.0
23.5	75 58 55.6	−3 9 55.9	23.5	120 41 37.2	+0 45 19.8	23.5	155 14 38.1	+3 39 55.5
24.0	81 53 25.4	2 44 47.6	24.0	126 49 15.5	1 17 46.2	24.0	161 42 18.9	4 4 7.9
24.5	87 48 35.5	2 17 47.7	24.5	133 0 36.8	1 49 38.7	24.5	168 14 39.4	4 25 28.1
25.0	93 44 57.1	1 49 10.4	25.0	139 16 15.8	2 20 35.2	25.0	174 51 59.4	4 43 33.5
25.5	99 43 4.0	1 19 10.9	25.5	145 36 46.5	2 50 12.7	25.5	181 34 36.2	4 58 2.1
26.0	105 43 32.5	−0 48 5.3	26.0	152 2 42.5	+3 18 7.0	26.0	188 22 43.8	+5 8 33.3
26.5	111 47 0.8	−0 16 10.5	26.5	158 34 35.3	3 43 52.9	26.5	195 16 31.7	5 14 48.3
27.0	117 54 8.3	+0 16 15.5	27.0	165 12 53.1	4 7 4.2	27.0	202 16 3.2	5 16 30.7
27.5	124 5 35.3	0 48 53.3	27.5	171 57 59.0	4 27 14.2	27.5	209 21 14.9	5 13 27.6
28.0	130 22 1.5	1 21 22.0	28.0	178 50 9.9	4 43 56.2	28.0	216 31 55.2	5 5 30.3
28.5	136 44 5.3	1 53 18.6	28.5	185 49 34.0	4 56 43.9	28.5	223 47 43.7	4 52 35.6
29.0	143 12 22.8	+2 24 18.6	29.0	192 56 9.4	+5 5 12.8	29.0	231 8 10.2	+4 34 46.4
29.5	149 47 25.6	2 53 55.2	29.5	200 9 42.7	5 9 1.1	29.5	238 32 35.4	4 12 13.1
30.0	156 29 39.7	3 21 39.7	30.0	207 29 47.5	5 7 51.3	30.0	246 0 11.0	3 45 13.5
30.5	163 19 23.1	3 47 2.0	30.5	214 55 44.4	5 1 31.5	30.5	253 30 0.8	3 14 13.4
31.0	170 16 44.8	4 9 30.7	31.0	222 26 40.8	4 49 57.2	31.0	261 1 2.9	2 39 45.8
31.5	177 21 41.8	+4 28 34.4	31.5	230 1 32.3	+4 33 12.4	31.5	268 32 11.0	+2 2 30.2

FOR GREENWICH MEAN NOON.

Date.	THE MOON'S EQUATOR. i Inclination to Earth's Equator.	$\triangle$ Ascend'g Node on Earth's Equator to Ascending Node on Ecliptic.	Ω' Ascend'g Node on Earth's Equator.	$\mathbb{C}$ Mean Longitude of the Moon.	Mean Solar Days.	Motion of $\mathbb{C}$
	° ′	° ′	° ′	° ′		° ′
Jan. 1	24 27.1	313 41.9	357 18.6	131 28.4	0.1	1 19.06
11	24 26.5	313 11.5	357 17.2	263 14.2	0.2	2 38.12
21	24 25.9	312 41.0	357 15.9	35 0.1	0.3	3 57.18
31	24 25.3	312 10.4	357 14.5	166 45.9	0.4	5 16.23
Feb. 10	24 24.7	311 39.8	357 13.2	298 31.8	0.5	6 35.29
					0.6	7 54.35
20	24 24.0	311 8.3	357 11.9	70 17.6	0.7	9 13.41
March 1	24 23.4	310 37.7	357 10.6	202 3.5	0.8	10 32.47
11	24 22.8	310 7.1	357 9.3	333 49.3	0.9	11 51.53
21	24 22.2	309 36.5	357 8.0	105 35.2		
31	24 21.6	309 5.9	357 6.7	237 21.0	1.0	13 10.58
					2.0	26 21.17
April 10	24 20.9	308 35.3	357 5.5	9 6.8	3.0	39 31.75
20	24 20.3	308 4.7	357 4.3	140 52.6	4.0	52 42.33
30	24 19.6	307 34.0	357 3.1	272 38.4	5.0	65 52.92
May 10	24 19.0	307 3.4	357 1.9	44 24.3	6.0	79 3.50
20	24 18.3	306 32.7	357 0.7	176 10.1	7.0	92 14.09
					8.0	105 24.67
30	24 17.7	306 2.0	356 59.5	307 56.0	9.0	118 35.25
June 9	24 17.0	305 31.3	356 58.3	79 41.8	10.0	131 45.84
19	24 16.4	305 0.6	356 57.2	211 27.7	Hours.	° ′
29	24 15.7	304 29.9	356 56.0	343 13.5	1	0 32.94
July 9	24 15.0	303 59.2	356 54.9	114 59.4	2	1 5.88
					3	1 38.82
19	24 14.3	303 28.4	356 53.8	246 45.2	4	2 11.76
29	24 13.6	302 57.6	356 52.7	18 31.0	5	2 44.70
Aug. 8	24 12.9	302 26.8	356 51.7	150 16.8	6	3 17.65
18	24 12.2	301 56.0	356 50.6	282 2.6	7	3 50.59
28	24 11.5	301 25.2	356 49.6	53 48.5	8	4 23.53
					9	4 56.47
Sept. 7	24 10.8	300 54.4	356 48.5	185 34.3	10	5 29.41
17	24 10.1	300 23.6	356 47.5	317 20.2	11	6 2.35
27	24 9.4	299 52.7	356 46.5	89 6.0	12	6 35.29
Oct. 7	24 8.7	299 21.9	356 45.5	220 51.9	13	7 8.23
17	24 8.0	298 51.0	356 44.5	352 37.7	14	7 41.17
					15	8 14.11
27	24 7.2	298 20.1	356 43.5	124 23.6	16	8 47.06
Nov. 6	24 6.5	297 49.2	356 42.5	256 9.4	17	9 20.00
16	24 5.8	297 18.2	356 41.6	27 55.2	18	9 52.94
26	24 5.1	296 47.3	356 40.7	159 41.0	19	10 25.88
Dec. 6	24 4.3	296 16.3	356 39.8	291 26.8	20	10 58.82
					21	11 31.76
16	24 3.5	295 45.1	356 38.9	63 12.7	22	12 4.70
26	24 2.7	295 14.1	356 38.0	194 58.5	23	12 37.64
36	24 1.9	294 43.1	356 37.1	326 44.4		

TABLE FOR THE LIBRATION OF THE MOON.

Argument, $(\Omega - \lambda)$ or $(\Omega - \lambda - 180°)$.

$\Omega - \lambda$	$\Delta\lambda$	$\frac{1}{a}$	B		$\Omega - \lambda$	$\Delta\lambda$	$\frac{1}{a}$	B	
°	′		° ′	°	°	′		° ′	°
0	0.0	39	0 0.0	180	46	0.6	56	1 3.9	134
1	0.0	39	0 1.6	179	47	0.6	57	1 4.9	133
2	0.0	39	0 3.1	178	48	0.6	58	1 6.0	132
3	0.1	39	0 4.7	177	49	0.6	59	1 7.0	131
4	0.1	39	0 6.2	176	50	0.6	60	1 8.0	130
5	0.1	39	0 7.7	175	51	0.6	62	1 9.0	129
6	0.2	39	0 9.3	174	52	0.6	63	1 10.0	128
7	0.2	39	0 10.8	173	53	0.5	64	1 10.9	127
8	0.2	39	0 12.4	172	54	0.5	66	1 11.8	126
9	0.2	39	0 13.9	171	55	0.5	67	1 12.7	125
10	0.2	39	0 15.4	170	56	0.5	69	1 13.6	124
11	0.3	39	0 16.9	169	57	0.5	71	1 14.5	123
12	0.3	40	0 18.5	168	58	0.5	73	1 15.3	122
13	0.3	40	0 20.0	167	59	0.5	75	1 16.1	121
14	0.3	40	0 21.5	166	60	0.5	77	1 16.9	120
15	0.3	40	0 23.0	165	61	0.5	80	1 17.6	119
16	0.3	40	0 24.5	164	62	0.5	83	1 18.4	118
17	0.3	40	0 26.0	163	63	0.5	86	1 19.1	117
18	0.3	41	0 27.4	162	64	0.5	89	1 19.8	116
19	0.4	41	0 28.9	161	65	0.4	92	1 20.4	115
20	0.4	41	0 30.4	160	66	0.4	95	1 21.1	114
21	0.4	41	0 31.8	159	67	0.4	99	1 21.7	113
22	0.4	42	0 33.2	158	68	0.4	103	1 22.3	112
23	0.4	42	0 34.7	157	69	0.4	108	1 22.9	111
24	0.4	42	0 36.1	156	70	0.4	113	1 23.4	110
25	0.4	43	0 37.5	155	71	0.4	119	1 23.9	109
26	0.5	43	0 38.9	154	72	0.4	125	1 24.4	108
27	0.5	43	0 40.3	153	73	0.4	132	1 24.9	107
28	0.5	44	0 41.7	152	74	0.3	141	1 25.3	106
29	0.5	44	0 43.1	151	75	0.3	150	1 25.7	105
30	0.5	45	0 44.4	150	76	0.3	160	1 26.1	104
31	0.5	45	0 45.7	149	77	0.3	172	1 26.5	103
32	0.5	46	0 47.0	148	78	0.2	186	1 26.8	102
33	0.5	46	0 48.4	147	79	0.2	202	1 27.1	101
34	0.5	47	0 49.7	146	80	0.2	222	1 27.4	100
35	0.5	47	0 51.0	145	81	0.2	247	1 27.7	99
36	0.5	48	0 52.2	144	82	0.2	278	1 27.9	98
37	0.5	48	0 53.4	143	83	0.1	318	1 28.1	97
38	0.6	49	0 54.7	142	84	0.1	370	1 28.3	96
39	0.6	50	0 55.9	141	85	0.1	440	1 28.5	95
40	0.6	50	0 57.1	140	86	0.1	555	1 28.6	94
41	0.6	51	0 58.3	139	87	0.1	740	1 28.7	93
42	0.6	52	0 59.4	138	88	0.0	1110	1 28.7	92
43	0.6	53	1 0.6	137	89	0.0	2220	1 28.8	91
44	0.6	54	1 1.7	136	90	0.0	∞	1 28.8	90
45	0.6	55	1 2.8	135					
	$\Delta\lambda$	$\frac{1}{a}$	B	$\Omega - \lambda$		$\Delta\lambda$	$\frac{1}{a}$	B	$\Omega - \lambda$

$\Delta\lambda$ has the sign of tan $(\lambda - \Omega)$
a has the sign of cos $(\Omega - \lambda)$
B has the sign of sin $(\Omega - \lambda)$

FOR GREENWICH MEAN NOON.

Date.	Apparent Obliquity of the Ecliptic. (HANSEN.)	Equation of Equinoxes		Precession of Equinoxes in Longitude.	The Sun's		Mean Longitude of Moon's Ascending Node.
		In Longitude.	In R. A.		Aberration.	Hor. Par.	
	° ′ ″	″	s	″	″	″	° ′
Jan. 1	23 27 7.04	− 12.79	− 0.781	0.00	− 20.80	9.00	131 13.5
11	7.19	12.52	0.765	1.38	20.79	9.00	130 41.7
21	7.39	12.36	0.755	2.75	20.77	8.99	130 10.0
31	7.63	12.33	0.753	4.13	20.74	8.98	129 38.2
Feb. 10	7.88	12.44	0.760	5.50	20.71	8.96	129 6.4
20	23 27 8.11	− 12.71	− 0.776	6.88	− 20.67	8.94	128 34.7
March 1	8.30	13.10	0.799	8.26	20.63	8.92	128 2.9
11	8.45	13.58	0.828	9.63	20.57	8.90	127 31.1
21	8.53	14.10	0.860	11.01	20.51	8.87	126 59.3
31	8.54	14.61	0.892	12.38	20.45	8.85	126 27.6
April 10	23 27 8.50	− 15.06	− 0.920	13.76	− 20.39	8.82	125 55.8
20	8.41	15.41	0.941	15.14	20.34	8.80	125 24.0
30	8.30	15.63	0.954	16.51	20.29	8.78	124 52.3
May 10	8.17	15.72	0.959	17.89	20.24	8.76	124 20.5
20	8.07	15.67	0.956	19.26	20.19	8.74	123 48.7
30	23 27 8.00	− 15.49	− 0.946	20.64	− 20.16	8.72	123 16.9
June 9	7.96	15.22	0.930	22.02	20.13	8.71	122 45.2
19	7.97	14.90	0.910	23.39	20.11	8.71	122 13.4
29	8.06	14.58	0.890	24.77	20.11	8.70	121 41.6
July 9	8.20	14.29	0.872	26.14	20.10	8.70	121 9.8
19	23 27 8.38	− 14.08	− 0.859	27.52	− 20.12	8.71	120 38.1
29	8.60	13.98	0.853	28.90	20.14	8.72	120 6.3
Aug. 8	8.85	14.01	0.855	30.27	20.17	8.73	119 34.5
18	9.09	14.17	0.865	31.65	20.20	8.75	119 2.8
28	9.32	14.46	0.883	33.02	20.24	8.77	118 31.0
Sept. 7	23 27 9.50	− 14.85	− 0.907	34.40	− 20.29	8.79	117 59.2
17	9.61	15.31	0.935	35.78	20.35	8.81	117 27.4
27	9.67	15.80	0.965	37.15	20.41	8.84	116 55.7
Oct. 7	9.68	16.27	0.993	38.53	20.47	8.87	116 23.9
17	9.64	16.68	1.018	39.90	20.53	8.88	115 52.1
27	23 27 9.55	− 16.97	− 1.036	41.28	− 20.59	8.91	115 20.3
Nov. 6	9.43	17.12	1.045	42.66	20.64	8.93	114 48.6
16	9.31	17.10	1.044	44.03	20.69	8.95	114 16.8
26	9.22	16.94	1.034	45.41	20.73	8.97	113 45.0
Dec. 6	9.17	16.68	1.018	46.78	20.76	8.98	113 13.3
16	23 27 9.17	− 16.34	− 0.997	48.16	− 20.78	8.99	112 41.5
26	9.23	15.96	0.974	49.54	20.79	9.00	112 9.7
36	23 27 9.36	− 15.59	− 0.952	50.91	− 20.79	9.00	111 37.9

Mean Obliquity, 1888.0, 23° 27′ 13″.64 (HANSEN).
Mean Obliquity, 1888.0, 23° 27′ 13″.33 (PETERS).

Precession for 1888.5	50″.2613	log 1.70123
Precession in a Solar Day	0″.1376	log 9.13863
Precession in a Sidereal Day	0″.1372	log 9.13744
Sun's Mean Equatorial Horizontal Parallax .	8″.848	log 0.94685

Daily Motion of ☊ −3′.177

PART II

ASTRONOMICAL EPHEMERIS

FOR THE

MERIDIAN OF WASHINGTON

EPH 88—18—7

FORMULÆ FOR THE REDUCTION OF THE POSITIONS OF THE FIXED STARS, USING THE NOTATION OF BESSEL, AND THE CONSTANTS OF PETERS AND STRUVE.

NOTATION.

τ, the time, reckoned in units of one year, from the beginning of the Besselian fictitious year, (1887, December $31^d.196$ = 1888, January $0^d.196$, Washington mean time),

α_o, δ_o, the star's mean right ascension and declination at the beginning of the fictitious year,

α, δ, the star's apparent right ascension and declination at the time τ,

μ, μ', the annual proper motion in right ascension and declination,

$\odot$, the sun's true longitude,

$\mathfrak{Q}$, the longitude of the moon's ascending node,

ω, the obliquity of the ecliptic,

Γ, the longitude of the sun's perigee,

Γ', the longitude of the moon's perigee,

$\mathbb{C}$, the moon's mean longitude

BESSELIAN STAR-NUMBERS.

$$
\begin{aligned}
A = \tau &- 0.34248 \sin \mathfrak{Q} && - 0.00011 \sin (3\odot - \Gamma)\\
&+ 0.00410 \sin 2\mathfrak{Q} && - 0.00005 \sin 2(\odot - \mathfrak{Q})\\
&- 0.02521 \sin 2\odot && + 0.00010 \sin 2(\odot - \Gamma')\\
&+ 0.00293 \sin (\odot + 82^\circ\ 8') && + 0.00009 \sin (2\Gamma' - \mathfrak{Q})\\
&+ 0.00025 \sin (2\odot - \mathfrak{Q}) && + 0.00005 \cos \Gamma'\\
&- 0.00405 \sin 2\mathbb{C} && + 0.00004 \sin 2\Gamma'\\
&+ 0.00135 \sin (\mathbb{C} - \Gamma')
\end{aligned}
$$

$$
\begin{aligned}
B = &- 9''.2239 \cos \mathfrak{Q} && - 0''.0027 \cos (3\odot - \Gamma)\\
&+ 0.0895 \cos 2\mathfrak{Q} && + 0.0067 \cos (2\odot - \mathfrak{Q})\\
&- 0.5506 \cos 2\odot && + 0.0024 \cos (2\Gamma' - \mathfrak{Q})\\
&- 0.0092 \cos (\odot + 280^\circ\ 57') && - 0.0023 \sin \Gamma'\\
&- 0.0886 \cos 2\mathbb{C} && + 0.0008 \cos 2\Gamma'
\end{aligned}
$$

$$C = - 20''.4451 \cos \omega \cos \odot$$

$$D = - 20.4451 \sin \odot$$

$$E = - 0.0461 \sin \mathfrak{Q} + 0''.0014 \sin 2\mathfrak{Q} - 0''.0033 \sin 2\odot$$

BESSEL'S *Star-Constants.*

$a = 3^s.07244 + 1^s.33689 \sin \alpha_o \tan \delta_o$ = precession in right ascension

$b = \frac{1}{15} \cos \alpha_o \tan \delta_o$

$c = \frac{1}{15} \cos \alpha_o \sec \delta_o$

$d = \frac{1}{15} \sin \alpha_o \sec \delta_o$

$a' = 20''.0533 \cos \alpha_o$ = precession in declination

$b' = - \sin \alpha_o$

$c' = \tan \omega \cos \delta_o - \sin \alpha_o \sin \delta_o$

$d' = \cos \alpha_o \sin \delta_o$

Reduction to Apparent Position.

$\alpha = \alpha_o + \tau\mu + Aa + Bb + Cc + Dd + E$ (in time)

$\delta = \delta_o + \tau\mu' + Aa' + Bb' + Cc' + Dd'$ (in arc)

INDEPENDENT STAR-NUMBERS.

$f = 46''.0866\ A + E$ (in arc) $= 3^s.07244\ A + \frac{1}{15} E$ (in time)

$g \sin G = B$ $\quad$ $h \sin H = C$ $\quad$ $i = C \tan \omega$

$g \cos G = 20''.0533\ A$ $\quad$ $h \cos H = D$

Reduction to Apparent Position.

$\alpha = \alpha_o + f + \tau\mu + \frac{1}{15} g \sin (G + \alpha_o) \tan \delta + \frac{1}{15} h \sin (H + \alpha_o) \sec \delta$ (in time)

$\delta = \delta_o + \tau\mu' + g \cos (G + \alpha_o) + h \cos (H + \alpha_o) \sin \delta + i \cos \delta$ (in arc)

NOTES.—(1) The independent star-numbers are more convenient, when only one or two apparent positions of a star are required, or when BESSEL's star-constants are not known with sufficient accuracy. Otherwise, the Besselian star-numbers are more convenient.

(2) In using the star-constants of the *British Association Catalogue*, $a, b, c, d, a', b', c', d'$, must be changed to $c, d, a, b, -c', -d', -a', -b'$, respectively.

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)		Log *A*.	Log *B*.	Log *C*.	Log *D*.	Solar Day. (Sid. Hour.)		Log *A*.	Log *B*.	Log *C*.	Log *D*.
Jan.	0	−9.3960	+0.8211	−0.5247	+1.3036	Feb.	15	−9.0807	+0.7369	−1.1968	+1.0465
	1	9.3897	0.8175	0.5653	1.3021		16	9.0790	0.7370	1.2017	1.0345
	2	9.3848	0.8141	0.6023	1.3005		17	9.0748	0.7381	1.2063	1.0220
	3	9.3808	0.8113	0.6363	1.2987		18	9.0677	0.7394	1.2108	1.0090
	4	9.3775	0.8097	0.6676	1.2968		19	9.0574	0.7403	1.2151	0.9955
h (7.0)	5	−9.3741	+0.8092	−0.6967	+1.2948	h (10.0)	20	−9.0443	+0.7402	−1.2192	+0.9814
	6	9.3700	0.8098	0.7239	1.2926		21	9.0296	0.7388	1.2232	0.9667
	7	9.3646	0.8111	0.7493	1.2902		22	9.0144	0.7360	1.2270	0.9513
	8	9.3576	0.8126	0.7731	1.2877		23	9.0006	0.7319	1.2307	0.9353
	9	9.3491	0.8136	0.7956	1.2851		24	8.9894	0.7271	1.2341	0.9185
	10	−9.3392	+0.8139	−0.8169	+1.2823		25	−8.9814	+0.7221	−1.2374	+0.9009
	11	9.3287	0.8129	0.8371	1.2793		26	8.9766	0.7176	1.2405	0.8825
	12	9.3182	0.8106	0.8562	1.2762		27	8.9742	0.7143	1.2435	0.8631
	13	9.3086	0.8073	0.8744	1.2729		28	8.9729	0.7125	1.2464	0.8426
	14	9.3006	0.8032	0.8917	1.2694		29	8.9709	0.7123	1.2491	0.8210
	15	−9.2945	+0.7990	−0.9082	+1.2658	Mar.	1	−8.9665	+0.7133	−1.2516	+0.7982
	16	9.2902	0.7951	0.9239	1.2620		2	8.9585	0.7151	1.2540	0.7740
	17	9.2873	0.7921	0.9390	1.2581		3	8.9464	0.7169	1.2562	0.7481
	18	9.2852	0.7903	0.9535	1.2540		4	8.9303	0.7182	1.2583	0.7206
	19	9.2828	0.7897	0.9674	1.2497		5	8.9111	0.7182	1.2602	0.6910
h (8.0)	20	−9.2794	+0.7901	−0.9807	+1.2452	h (11.0)	6	−8.8906	+0.7168	−1.2620	+0.6592
	21	9.2743	0.7912	0.9934	1.2405		7	8.8706	0.7140	1.2637	0.6246
	22	9.2671	0.7922	1.0056	1.2357		8	8.8535	0.7101	1.2652	0.5871
	23	9.2580	0.7927	1.0174	1.2306		9	8.8412	0.7055	1.2666	0.5457
	24	9.2474	0.7921	1.0287	1.2254		10	8.8343	0.7010	1.2679	0.5000
	25	−9.2360	+0.7903	−1.0396	+1.2200		11	−8.8326	+0.6974	−1.2690	+0.4488
	26	9.2248	0.7871	1.0501	1.2144		12	8.8342	0.6952	1.2700	0.3905
	27	9.2146	0.7830	1.0602	1.2085		13	8.8366	0.6946	1.2708	0.3231
	28	9.2062	0.7782	1.0700	1.2024		14	8.8377	0.6956	1.2715	0.2432
	29	9.1998	0.7735	1.0794	1.1961		15	8.8350	0.6977	1.2721	0.1452
	30	−9.1952	+0.7694	−1.0885	+1.1896		16	−8.8271	+0.7004	−1.2726	+0.0183
Feb.	31	9.1919	0.7663	1.0973	1.1828		17	8.8136	0.7029	1.2729	9.8382
	1	9.1889	0.7646	1.1057	1.1758		18	8.7944	0.7046	1.2731	+9.5250
	2	9.1851	0.7643	1.1138	1.1685		19	8.7711	0.7050	1.2731	−8.2788
	3	9.1797	0.7648	1.1217	1.1610		20	8.7458	0.7038	1.2731	9.5717
h (9.0)	4	−9.1719	+0.7658	−1.1293	+1.1532	h (12.0)	21	−8.7212	+0.7012	−1.2729	−9.8615
	5	9.1617	0.7666	1.1366	1.1451		22	8.7000	0.6977	1.2725	0.0334
	6	9.1492	0.7667	1.1436	1.1368		23	8.6847	0.6937	1.2721	0.1563
	7	9.1354	0.7656	1.1504	1.1281		24	8.6754	0.6902	1.2715	0.2513
	8	9.1212	0.7631	1.1570	1.1192		25	8.6715	0.6877	1.2707	0.3294
	9	−9.1081	+0.7593	−1.1633	+1.1099		26	−8.6706	+0.6867	−1.2699	−0.3955
	10	9.0971	0.7546	1.1694	1.1003		27	8.6687	0.6875	1.2689	0.4526
	11	9.0891	0.7495	1.1753	1.0903		28	8.6626	0.6898	1.2678	0.5030
	12	9.0842	0.7447	1.1810	1.0799		29	8.6500	0.6930	1.2665	0 5480
	13	9.0819	0.7407	1.1864	1.0692		30	8.6284	0.6965	1.2652	0.5886
	14	−9.0813	+0.7381	−1.1916	+1.0581		31	−8.5969	+0.6996	−1.2637	−0.6256
	15	−9.0807	+0.7369	−1.1968	+1.0465		32	−8.5558	+0.7016	−1.2620	−0.6596

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	Log *A.*	Log *B.*	Log *C.*	Log *D.*	Solar Day. (Sid. Hour.)	Log *A.*	Log *B.*	Log *C.*	Log *D.*
Apr. 1	−8.5558	+0.7016	−1.2620	−0.6596	May 17	+8.8598	+0.7260	−1.0015	−1.2374
2	8.5076	0.7022	1.2602	0.6909	18	8.8713	0.7240	0.9897	1.2419
3	8.4548	0.7012	1.2583	0.7200	19	8.8801	0.7232	0.9775	1.2463
4	8.4036	0.6990	1.2563	0.7471	h 20	8.8876	0.7238	0.9649	1.2505
h (13.0) 5	8.3606	0.6959	1.2541	0.7725	(16.0) 21	8.8963	0.7258	0.9518	1.2545
6	−8.3314	+0.6928	−1.2518	−0.7964	22	+8.9078	+0.7290	−0.9381	−1.2584
7	8.3170	0.6902	1.2493	0.8189	23	8.9234	0.7328	0.9238	1.2621
8	8.3153	0.6890	1.2467	0.8402	24	8.9426	0.7365	0.9089	1.2657
9	8.3195	0.6893	1.2439	0.8603	25	8.9645	0.7395	0.8934	1.2691
10	8.3204	0.6913	1.2411	0.8794	26	8.9876	0.7413	0.8772	1.2723
11	−8.3107	+0.6945	−1.2381	−0.8976	27	+9.0101	+0.7416	−0.8603	−1.2754
12	8.2835	0.6985	1.2349	0.9149	28	9.0304	0.7405	0.8425	1.2784
13	8.2338	0.7026	1.2315	0.9314	29	9.0474	0.7382	0.8238	1.2812
14	8.1529	0.7059	1.2280	0.9472	30	9.0607	0.7354	0.8042	1.2839
15	8.0310	0.7080	1.2244	0.9623	31	9.0702	0.7327	0.7836	1.2865
16	−7.8463	+0.7086	−1.2206	−0.9767	June 1	+9.0767	+0.7306	−0.7619	−1.2889
17	7.5366	0.7077	1.2166	0.9906	2	9.0815	0.7298	0.7388	1.2912
18	−6.5441	0.7056	1.2125	1.0039	3	9.0856	0.7304	0.7143	1.2934
19	+7.3181	0.7030	1.2082	1.0166	h 4	9.0907	0.7324	0.6882	1.2954
20	7.5752	0.7005	1.2038	1.0289	(17.0) 5	9.0978	0.7353	0.6604	1.2973
h (14.0) 21	+7.6822	+0.6989	−1.1992	−1.0407	6	+9.1076	+0.7385	−0.6306	−1.2991
22	7.7388	0.6985	1.1944	1.0521	7	9.1199	0.7415	0.5984	1.3007
23	7.7868	0.6998	1.1894	1.0631	8	9.1342	0.7436	0.5634	1.3022
24	7.8519	0.7026	1.1842	1.0736	9	9.1494	0.7443	0.5253	1.3036
25	7.9420	0.7065	1.1789	1.0838	10	9.1644	0.7436	0.4834	1.3048
26	+8.0500	+0.7109	−1.1734	−1.0936	11	+9.1779	+0.7415	−0.4369	−1.3059
27	8.1629	0.7149	1.1677	1.1031	12	9.1896	0.7384	0.3847	1.3069
28	8.2683	0.7181	1.1618	1.1123	13	9.1988	0.7350	0.3252	1.3078
29	8.3610	0.7199	1.1557	1.1211	14	9.2058	0.7318	0.2561	1.3086
30	8.4371	0.7202	1.1494	1.1296	15	9.2113	0.7295	0.1730	1.3092
May 1	+8.4969	+0.7191	−1.1428	−1.1379	16	+9.2159	+0.7285	−0.0726	−1.3097
2	8.5407	0.7171	1.1360	1.1458	17	9.2207	0.7289	9.9395	1.3101
3	8.5705	0.7147	1.1290	1.1535	18	9.2267	0.7306	9.7466	1.3104
4	8.5889	0.7126	1.1218	1.1609	h 19	9.2342	0.7331	−9.3909	1.3106
5	8.5993	0.7115	1.1143	1.1681	(18.0) 20	9.2438	0.7357	+8.8261	1.3106
h (15.0) 6	+8.6057	+0.7118	−1.1065	−1.1751	21	+9.2551	+0.7378	+9.5786	−1.3105
7	8.6118	0.7136	1.0985	1.1818	22	9.2675	0.7389	9.8395	1.3103
8	8.6222	0.7168	1.0902	1.1882	23	9.2799	0.7385	0.0013	1.3100
9	8.6392	0.7208	1.0816	1.1945	24	9.2918	0.7366	0.1186	1.3096
10	8.6639	0.7250	1.0728	1.2006	25	9.3022	0.7334	0.2108	1.3090
11	+8.6945	+0.7287	−1.0637	−1.2064	26	+9.3106	+0.7294	+0.2866	−1.3083
12	8.7288	0.7314	1.0542	1.2120	27	9.3170	0.7252	0.3512	1.3075
13	8.7631	0.7326	1.0444	1.2175	28	9.3215	0.7215	0.4073	1.3066
14	8.7948	0.7323	1.0342	1.2227	29	9.3246	0.7189	0.4569	1.3055
15	8.8220	0.7308	1.0237	1.2278	30	9.3272	0.7177	0.5013	1.3043
16	+8.8437	+0.7284	−1.0128	−1.2327	31	+9.3301	+0.7180	+0.5414	−1.3030
17	+8.8598	+0.7260	−1.0015	−1.2374	32	+9.3338	+0.7194	+0.5780	−1.3016

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)		Log *A*.	Log *B*.	Log *C*.	Log *D*.	Solar Day. (Sid. Hour.)		Log *A*.	Log *B*.	Log *C*.	Log *D*.
July	1	+9.3301	+0.7180	+0.5414	−1.3030	Aug.	16	+9.5400	+0.6377	+1.1848	−1.0726
	2	9.3338	0.7194	0.5780	1.3016		17	9.5454	0.6350	1.1899	1.0621
	3	9.3389	0.7214	0.6117	1.3000		18	9.5503	0.6305	1.1948	1.0512
	4	9.3457	0.7233	0.6429	1.2983		19	9.5544	0.6246	1.1995	1.0399
	5	9.3538	0.7245	0.6718	1.2965	h (22.0)	20	9.5574	0.6179	1.2040	1.0282
h (19.0)	6	+9.3627	+0.7245	+0.6988	−1.2946		21	+9.5593	+0.6114	+1.2084	−1.0160
	7	9.3718	0.7229	0.7241	1.2925		22	9.5601	0.6058	1.2127	1.0034
	8	9.3803	0.7198	0.7479	1.2903		23	9.5604	0.6019	1.2168	0.9902
	9	9.3877	0.7155	0.7704	1.2880		24	9.5605	0.6001	1.2207	0.9765
	10	9.3937	0.7106	0.7917	1.2855		25	9.5608	0.6001	1.2244	0.9622
	11	+9.3983	+0.7057	+0.8119	−1.2829		26	+9.5618	+0.6015	+1.2280	−0.9473
	12	9.4017	0.7016	0.8310	1.2802		27	9.5637	0.6035	1.2315	0.9317
	13	9.4044	0.6987	0.8492	1.2774		28	9.5666	0.6052	1.2348	0.9154
	14	9.4070	0.6974	0.8665	1.2744		29	9.5702	0.6058	1.2379	0.8983
	15	9.4101	0.6975	0.8831	1.2712		30	9.5743	0.6046	1.2409	0.8804
	16	+9.4142	+0.6987	+0.8990	−1.2679		31	+9.5783	+0.6015	+1.2438	−0.8616
	17	9.4195	0.7003	0.9142	1.2644	Sept.	1	9.5820	0.5966	1.2465	0.8418
	18	9.4262	0.7016	0.9287	1.2608		2	9.5849	0.5904	1.2491	0.8209
	19	9.4338	0.7019	0.9427	1.2571		3	9.5869	0.5838	1.2515	0.7988
	20	9.4417	0.7009	0.9561	1.2532		4	9.5881	0.5777	1.2538	0.7754
h (20.0)	21	+9.4495	+0.6981	+0.9690	−1.2491	h (23.0)	5	+9.5886	+0.5729	+1.2560	−0.7505
	22	9.4564	0.6939	0.9814	1.2449		6	9.5888	0.5701	1.2581	0.7239
	23	9.4621	0.6886	0.9934	1.2405		7	9.5891	0.5696	1.2600	0.6954
	24	9.4665	0.6828	1.0049	1.2360		8	9.5899	0.5709	1.2618	0.6649
	25	9.4694	0.6773	1.0160	1.2312		9	9.5915	0.5735	1.2634	0.6318
	26	+9.4712	+0.6729	+1.0268	−1.2263		10	+9.5940	+0.5765	+1.2649	−0.5958
	27	9.4724	0.6700	1.0371	1.2213		11	9.5974	0.5787	1.2663	0.5565
	28	9.4736	0.6687	1.0471	1.2160		12	9.6013	0.5796	1.2676	0.5130
	29	9.4752	0.6689	1.0567	1.2105		13	9.6055	0.5785	1.2687	0.4646
	30	9.4778	0.6701	1.0661	1.2048		14	9.6095	0.5754	1.2696	0.4098
	31	+9.4815	+0.6714	+1.0751	−1.1990		15	+9.6128	+0.5706	+1.2705	−0.3470
Aug.	1	9.4863	0.6723	1.0838	1.1930		16	9.6153	0.5647	1.2713	0.2733
	2	9.4919	0.6719	1.0922	1.1868		17	9.6168	0.5587	1.2719	0.1850
	3	9.4977	0.6699	1.1003	1.1803		18	9.6174	0.5536	1.2724	0.0730
	4	9.5034	0.6661	1.1082	1.1736		19	9.6174	0.5502	1.2728	9.9212
h (21.0)	5	+9.5084	+0.6609	+1.1158	−1.1667	h (0.0)	20	+9.6171	+0.5491	+1.2730	−9.6857
	6	9.5124	0.6548	1.1232	1.1595		21	9.6169	0.5503	1.2731	−9.1303
	7	9.5154	0.6484	1.1303	1.1521		22	9.6172	0.5532	1.2731	+9.3304
	8	9.5173	0.6426	1.1372	1.1444		23	9.6183	0.5572	1.2730	9.7513
	9	9.5186	0.6382	1.1439	1.1365		24	9.6203	0.5611	1.2727	9.9610
	10	+9.5196	+0.6356	+1.1504	−1.1283		25	+9.6231	+0.5641	+1.2723	+0.1018
	11	9.5209	0.6347	1.1566	1.1198		26	9.6263	0.5653	1.2718	0.2079
	12	9.5228	0.6353	1.1626	1.1110		27	9.6298	0.5645	1.2711	0.2925
	13	9.5258	0.6367	1.1685	1.1019		28	9.6330	0.5617	1.2703	0.3636
	14	9.5298	0.6381	1.1741	1.0925		29	9.6356	0.5573	1.2694	+0.4246
	15	+9.5346	+0.6387	+1.1795	−1.0827		30	+9.6375	+0.5522	+1.2684	+0.4781
	16	+9.5400	+0.6377	+1.1848	−1.0726		31	+9.6387	+0.5473	+1.2672	+0.5256

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	Log *A.*	Log *B.*	Log *C.*	Log *D.*	Solar Day. (Sid. Hour.)	Log *A.*	Log *B.*	Log *C.*	Log *D.*
Oct. 1	+9.6387	+0.5473	+1.2672	+0.5256	Nov. 16	+9.7287	+0.5930	+1.0280	+1.2258
2	9.6392	0.5437	1.2659	0.5683	17	9.7308	0.5986	1.0167	1.2309
3	9.6394	0.5421	1.2645	0.6070	18	9.7336	0.6037	1.0050	1.2359
h 4	9.6396	0.5428	1.2629	0.6425	h 19	9.7369	0.6076	0.9928	1.2408
(1.0) 5	9.6401	0.5458	1.2612	0.6752	(4.0) 20	9.7406	0.6096	0.9801	1.2454
6	+9.6413	+0.5503	+1.2593	+0.7055	21	+9.7442	+0.6095	+0.9669	+1.2498
7	9.6433	0.5554	1.2573	0.7337	22	9.7476	0.6077	0.9531	1.2541
8	9.6462	0.5601	1.2552	0.7601	23	9.7505	0.6047	0.9387	1.2582
9	9.6497	0.5636	1.2529	0.7849	24	9.7529	0.6011	0.9237	1.2621
10	9.6536	0.5651	1.2505	0.8082	25	9.7546	0.5981	0.9080	1.2659
11	+9.6574	+0.5645	+1.2479	+0.8302	26	+9.7560	+0.5963	+0.8916	+1.2695
12	9.6608	0.5621	1.2452	0.8510	27	9.7572	0.5964	0.8744	1.2729
13	9.6635	0.5583	1.2424	0.8707	28	9.7585	0.5984	0.8563	1.2761
14	9.6654	0.5541	1.2394	0.8895	29	9.7601	0.6021	0.8373	1.2792
15	9.6664	0.5505	1.2362	0.9075	30	9.7624	0.6068	0.8173	1.2822
16	+9.6668	+0.5484	+1.2329	+0.9247	Dec. 1	+9.7653	+0.6116	+0.7961	+1.2850
17	9.6669	0.5485	1.2294	0.9411	2	9.7688	0.6156	0.7737	1.2876
18	9.6670	0.5509	1.2258	0.9567	3	9.7727	0.6181	0.7500	1.2901
h 19	9.6675	0.5552	1.2220	0.9716	h 4	9.7767	0.6187	0.7247	1.2925
(2.0) 20	9.6687	0.5608	1.2180	0.9859	(5.0) 5	9.7806	0.6173	0.6977	1.2947
21	+9.6706	+0.5666	+1.2138	+0.9997	6	+9.7841	+0.6143	+0.6688	+1.2967
22	9.6732	0.5716	1.2095	1.0129	7	9.7870	0.6103	0.6376	1.2986
23	9.6764	0.5751	1.2050	1.0256	8	9.7893	0.6061	0.6039	1.3004
24	9.6799	0.5766	1.2003	1.0378	9	9.7909	0.6027	0.5672	1.3020
25	9.6833	0.5760	1.1954	1.0496	10	9.7922	0.6006	0.5269	1.3035
26	+9.6863	+0.5737	+1.1904	+1.0610	11	+9.7933	+0.6005	+0.4823	+1.3048
27	9.6887	0.5704	1.1852	1.0719	12	9.7945	0.6022	0.4324	1.3060
28	9.6905	0.5670	1.1797	1.0824	13	9.7960	0.6054	0.3760	1.3071
29	9.6916	0.5645	1.1740	1.0925	14	9.7980	0.6093	0.3109	1.3080
30	9.6924	0.5637	1.1682	1.1023	15	9.8006	0.6130	0.2341	1.3088
31	+9.6930	+0.5650	+1.1621	+1.1118	16	+9.8037	+0.6157	+0.1408	+1.3094
Nov. 1	9.6939	0.5684	1.1558	1.1209	17	9.8071	0.6166	0.0212	1.3099
2	9.6954	0.5735	1.1492	1.1297	18	9.8106	0.6156	9.8555	1.3103
h 3	9.6975	0.5794	1.1424	1.1383	h 19	9.8139	0.6126	9.5843	1.3105
(3.0) 4	9.7004	0.5852	1.1354	1.1465	(6.0) 20	9.8168	0.6082	+8.6990	1.3106
5	+9.7040	+0.5899	+1.1281	+1.1544	21	+9.8192	+0.6030	−9.4518	+1.3105
6	9.7080	0.5928	1.1206	1.1621	22	9.8211	0.5978	9.7903	1.3103
7	9.7120	0.5938	1.1127	1.1695	23	9.8226	0.5937	9.9777	1.3100
8	9.7158	0.5928	1.1046	1.1767	24	9.8238	0.5912	0.1082	1.3096
9	9.7190	0.5903	1.0962	1.1836	25	9.8250	0.5907	0.2084	1.3090
10	+9.7216	+0.5871	+1.0875	+1.1903	26	+9.8265	+0.5919	−0.2893	+1.3083
11	9.7235	0.5841	1.0785	1.1968	27	9.8284	0.5945	0.3577	1.3074
12	9.7247	0.5822	1.0691	1.2030	28	9.8308	0.5974	0.4165	1.3064
13	9.7255	0.5821	1.0594	1.2090	29	9.8338	0.5999	0.4683	1.3052
14	9.7262	0.5841	1.0493	1.2148	30	9.8371	0.6010	0.5144	1.3039
15	+9.7272	+0.5879	+1.0389	+1.2204	31	+9.8407	+0.6003	−0.5559	+1.3025
16	+9.7287	+0.5930	+1.0280	+1.2258	32	+9.8441	+0.5975	−0.5937	+1.3009

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)		τ	f		G		H		Log g.	Log h.	i	Log i.
			In Arc.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
		y	″	s	° ′	h m	° ′	h m			″	
Jan.	0	0.0008	−11.51	−0.767	127 0	8 28.0	350 33	23 22.2	+0.9187	+1.3095	−1.45	−0.1622
	1	0.0036	11.34	0.756	126 50	8 27.3	349 37	23 18.5	0.9142	1.3093	1.60	0.2028
	2	0.0063	11.21	0.747	126 44	8 26.9	348 40	23 14.7	0.9102	1.3090	1.74	0.2397
	3	0.0090	11.11	0.740	126 39	8 26.6	347 44	23 10.9	0.9070	1.3088	1.88	0.2736
	4	0.0118	11.03	0.734	126 33	8 26.2	346 47	23 7.1	0.9049	1.3085	2.02	0.3049
h (7.0)	5	0.0145	−10.94	−0.729	126 22	8 25.5	345 50	23 3.3	+0.9033	+1.3082	−2.16	−0.3341
	6	0.0173	10.84	0.723	126 4	8 24.3	344 54	22 59.6	0.9022	1.3078	2.30	0.3613
	7	0.0200	10.71	0.714	125 39	8 22.6	343 57	22 55.8	0.9012	1.3075	2.44	0.3867
	8	0.0227	10.53	0.702	125 8	8 20.5	343 0	22 52.0	0.9000	1.3071	2.57	0.4105
	9	0.0255	10.33	0.689	124 32	8 18.1	342 3	22 48.2	0.8978	1.3067	2.71	0.4330
	10	0.0282	−10.10	−0.674	123 55	8 15.7	341 6	22 44.4	+0.8948	+1.3063	−2.85	−0.4543
	11	0.0310	9.86	0.657	123 20	8 13.3	340 8	22 40.5	0.8909	1.3059	2.98	0.4744
	12	0.0337	9.62	0.642	122 50	8 11.3	339 11	22 36.7	0.8862	1.3055	3.12	0.4936
	13	0.0364	9.41	0.628	122 28	8 9.9	338 14	22 32.9	0.8811	1.3050	3.25	0.5118
	14	0.0392	9.24	0.616	122 14	8 8.9	337 16	22 29.1	0.8759	1.3046	3.38	0.5291
	15	0.0419	−9.11	−0.608	122 7	8 8.5	336 18	22 25.2	+0.8711	+1.3041	−3.51	−0.5456
	16	0.0446	9.02	0.602	122 5	8 8.3	335 20	22 21.3	0.8671	1.3036	3.64	0.5614
	17	0.0474	8.97	0.597	122 6	8 8.4	334 23	22 17.5	0.8641	1.3031	3.77	0.5765
	18	0.0501	8.92	0.595	122 5	8 8.3	333 24	22 13.6	0.8622	1.3025	3.90	0.5909
	19	0.0529	8.87	0.592	121 58	8 7.9	332 26	22 9.7	0.8611	1.3020	4.03	0.6048
h (8.0)	20	0.0556	−8.80	−0.587	121 44	8 6.9	331 28	22 5.9	+0.8605	+1.3015	−4.15	−0.6180
	21	0.0583	8.70	0.580	121 23	8 5.5	330 29	22 1.9	0.8599	1.3009	4.27	0.6308
	22	0.0611	8.56	0.571	120 54	8 3.6	329 31	21 58.1	0.8587	1.3003	4.40	0.6430
	23	0.0638	8.38	0.559	120 21	8 1.4	328 32	21 54.1	0.8567	1.2997	4.52	0.6548
	24	0.0665	8.18	0.545	119 46	7 59.1	327 33	21 50.2	0.8536	1.2991	4.64	0.6662
	25	0.0693	−7.97	−0.531	119 14	7 56.9	326 34	21 46.3	+0.8494	+1.2985	−4.75	−0.6771
	26	0.0720	7.77	0.518	118 47	7 55.1	325 35	21 42.3	0.8444	1.2979	4.87	0.6876
	27	0.0748	7.59	0.506	118 27	7 53.8	324 35	21 38.3	0.8388	1.2973	4.99	0.6978
	28	0.0775	7.44	0.496	118 15	7 53.0	323 36	21 34.4	0.8333	1.2967	5.10	0.7074
	29	0.0802	7.33	0.489	118 9	7 52.6	322 36	21 30.4	0.8282	1.2960	5.21	0.7168
	30	0.0830	−7.26	−0.484	118 8	7 52.5	321 36	21 26.4	+0.8240	+1.2954	−5.32	−0.7260
	31	0.0857	7.20	0.480	118 7	7 52.5	320 36	21 22.4	0.8209	1.2947	5.43	0.7347
Feb.	1	0.0884	7.15	0.477	118 3	7 52.2	319 36	21 18.4	0.8189	1.2941	5.54	0.7431
	2	0.0912	7.09	0.473	117 51	7 51.4	318 36	21 14.4	0.8177	1.2934	5.64	0.7513
	3	0.0939	7.00	0.467	117 32	7 50.1	317 35	21 10.3	0.8170	1.2927	5.74	0.7591
h (9.0)	4	0.0967	−6.88	−0.459	117 4	7 48.3	316 35	21 6.3	+0.8162	+1.2921	−5.84	−0.7667
	5	0.0994	6.72	0.448	116 28	7 45.9	315 34	21 2.3	0.8148	1.2914	5.94	0.7740
	6	0.1021	6.53	0.435	115 49	7 43.3	314 33	20 58.2	0.8124	1.2908	6.04	0.7810
	7	0.1049	6.33	0.422	115 10	7 40.7	313 32	20 54.1	0.8089	1.2901	6.14	0.7879
	8	0.1076	6.13	0.409	114 35	7 38.3	312 30	20 50.0	0.8043	1.2894	6.23	0.7945
	9	0.1104	−5.95	−0.396	114 7	7 36.5	311 29	20 45.9	+0.7990	+1.2888	−6.32	−0.8008
	10	0.1131	5.80	0.386	113 49	7 35.3	310 27	20 41.8	0.7932	1.2881	6.41	0.8069
	11	0.1158	5.69	0.380	113 40	7 34.7	309 26	20 37.7	0.7877	1.2875	6.50	0.8127
	12	0.1186	5.63	0.375	113 40	7 34.7	308 24	20 33.6	0.7828	1.2868	6.58	0.8184
	13	0.1213	5.60	0.373	113 45	7 35.0	307 21	20 29.4	0.7791	1.2862	6.67	0.8239
	14	0.1240	−5.59	−0.373	113 51	7 35.4	306 19	20 25.3	+0.7768	+1.2855	−6.75	−0.8292
	15	0.1268	−5.58	−0.372	113 52	7 35.5	305 17	20 21.1	+0.7758	+1.2849	−6.83	−0.8342

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)		τ	f		G		H		Log g.	Log h.	i	Log i.
			In Arc.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
		y	″	s	° ′	h m	° ′	h m			″	
Feb.	15	0.1268	−5.58	−0.372	113 52	7 35.5	305 17	20 21.1	+0.7758	+1.2849	−6.83	−0.8342
	16	0.1295	5.56	0.370	113 47	7 35.1	304 14	20 16.9	0.7756	1.2843	6.90	0.8391
	17	0.1323	5.51	0.367	113 32	7 34.1	303 11	20 12.7	0.7758	1.2837	6.98	0.8437
	18	0.1350	5.42	0.361	113 8	7 32.5	302 9	20 8.6	0.7758	1.2831	7.05	0.8483
	19	0.1377	5.29	0.353	112 36	7 30.4	301 5	20 4.3	0.7750	1.2825	7.12	0.8526
(h 10.0)	20	0.1405	−5.14	−0.342	112 0	7 28.0	300 2	20 0.1	+0.7730	+1.2819	−7.19	−0.8567
	21	0.1432	4.97	0.331	111 23	7 25.5	298 59	19 55.9	0.7698	1.2814	7.26	0.8607
	22	0.1459	4.80	0.320	110 51	7 23.4	297 56	19 51.7	0.7654	1.2808	7.32	0.8645
	23	0.1487	4.65	0.310	110 25	7 21.7	296 52	19 47.5	0.7601	1.2803	7.38	0.8681
	24	0.1514	4.53	0.302	110 9	7 20.6	295 48	19 43.2	0.7545	1.2797	7.44	0.8715
	25	0.1542	−4.45	−0.296	110 1	7 20.1	294 45	19 39.0	+0.7492	+1.2792	−7.50	−0.8749
	26	0.1569	4.41	0.293	110 0	7 20.0	293 41	19 34.7	0.7447	1.2788	7.55	0.8780
	27	0.1596	4.38	0.291	110 3	7 20.2	292 36	19 30.4	0.7415	1.2783	7.60	0.8810
	28	0.1624	4.37	0.291	110 4	7 20.3	291 32	19 26.1	0.7397	1.2779	7.65	0.8838
	29	0 1651	4.35	0.290	109 59	7 19.9	290 28	19 21.9	0.7392	1.2774	7.70	0.8865
Mar.	1	0.1678	−4.30	−0.287	109 46	7 19.1	289 24	19 17.6	+0.7397	+1.2770	−7.75	−0.8890
	2	0.1706	4.22	0.281	109 21	7 17.4	288 19	19 13.3	0.7403	1.2766	7.79	0.8914
	3	0.1733	4.11	0.274	108 47	7 15.1	287 15	19 9.0	0.7407	1.2762	7.83	0.8936
	4	0.1761	3.96	0.264	108 6	7 12.4	286 10	19 4.7	0.7402	1.2758	7.87	0.8957
	5	0.1788	3.79	0.253	107 22	7 9.5	285 6	19 0.4	0.7385	1.2755	7.90	0.8977
(h 11.0)	6	0.1815	−3.62	−0.241	106 39	7 6.6	284 1	18 56.1	+0.7355	+1.2751	−7.93	−0.8995
	7	0.1843	3.46	0.230	106 3	7 4.2	282 56	18 51.7	0.7313	1.2748	7.97	0.9012
	8	0.1870	3.33	0.222	105 35	7 2.3	281 51	18 47.4	0.7263	1.2746	7.99	0.9027
	9	0.1898	3.23	0.216	105 20	7 1.3	280 46	18 43.1	0.7212	1.2743	8.02	0.9040
	10	0.1925	3.18	0.212	105 15	7 1.0	279 41	18 38.7	0.7166	1.2741	8.04	0.9053
	11	0.1952	−3.17	−0.211	105 19	7 1.3	278 36	18 34.4	+0.7131	+1.2739	−8.06	−0.9064
	12	0.1980	3.18	0.212	105 26	7 1.7	277 31	18 30.1	0.7112	1.2737	8.08	0.9074
	13	0.2007	3.20	0.213	105 32	7 2.1	276 26	18 25.7	0.7108	1.2736	8.09	0.9082
	14	0.2034	3.21	0.213	105 33	7 2.2	275 21	18 21.4	0.7118	1.2734	8.11	0.9090
	15	0.2062	3.19	0.212	105 23	7 1.5	274 16	18 17 1	0.7136	1.2733	8.12	0.9096
	16	0.2089	−3.13	−0.209	105 2	7 0.1	273 11	18 12.7	+0.7155	+1.2733	−8.13	−0.9100
	17	0.2117	3.04	0.202	104 30	6 58.0	272 6	18 8.4	0.7170	1.2732	8.13	0.9103
	18	0.2144	2.91	0.194	103 51	6 55.4	271 1	18 4.1	0.7174	1.2731	8.14	0.9105
	19	0.2171	2.76	0.184	103 9	6 52.6	269 56	17 59.7	0.7165	1.2731	8.14	0.9106
	20	0.2199	2.61	0.173	102 28	6 49.8	268 52	17 55.5	0.7141	1.2731	8.14	0.9105
(h 12.0)	21	0.2226	−2.46	−0.164	101 52	6 47.5	267 47	17 51.1	+0.7106	+1.2732	−8.13	−0.9103
	22	0.2253	2.35	0.156	101 24	6 45.6	266 42	17 46.8	0.7063	1.2732	8.13	0.9099
	23	0.2281	2.27	0.151	101 7	6 44.5	265 37	17 42.5	0.7020	1.2733	8.12	0.9095
	24	0.2308	2.22	0.148	100 58	6 43.9	264 33	17 38.2	0.6982	1.2734	8.11	0.9089
	25	0.2336	2.20	0.146	100 56	6 43.7	263 28	17 33.9	0.6957	1.2736	8.10	0.9082
	26	0.2363	−2.20	−0.146	100 56	6 43.7	262 23	17 29.5	+0.6947	+1.2737	−8.08	−0.9074
	27	0.2390	2.19	0.146	100 52	6 43.5	261 19	17 25.3	0.6954	1.2739	8.06	0.9064
	28	0.2418	2.16	0.144	100 40	6 42.7	260 15	17 21.0	0.6973	1.2741	8.04	0.9053
	29	0.2445	2.10	0.140	100 18	6 41.2	259 11	17 16.7	0.7000	1.2744	8.02	0.9040
	30	0.2472	2.00	0.133	99 44	6 38.9	258 6	17 12.4	0.7028	1.2746	7.99	0.9026
	31	0.2500	−1.86	−0.124	99 0	6 36.0	257 2	17 8.1	+0.7050	+1.2749	−7.96	−0.9011
	32	0.2527	−1.70	−0.113	98 9	6 32.6	255 59	17 3.9	+0.7061	+1.2752	−7.93	−0.8994

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)		τ	f		G		H		Log g.	Log h.	i	Log i.
			In Arc.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
		y	$''$	s	° ′	h m	° ′	h m			$''$	
Apr.	1	0.2527	−1.70	−0.113	98 9	6 32.6	255 59	17 3.9	+0.7061	+1.2752	−7.93	−0.8994
	2	0.2555	1.52	0.101	97 18	6 29.2	254 55	16 59.7	0.7057	1.2755	7.90	0.8977
	3	0.2582	1.35	0.090	96 29	6 25.9	253 51	16 55.4	0.7040	1.2758	7.87	0.8957
	4	0.2609	1.21	0.080	95 48	6 23.2	252 48	16 51.2	0.7012	1.2762	7.83	0.8937
h (13 0)	5	0.2637	1.10	0.073	95 18	6 21.2	251 44	16 46.9	0.6978	1.2765	7.79	0.8915
	6	0.2664	−1.03	−0.068	94 59	6 19.9	250 41	16 42.7	+0.6944	+1.2769	−7.75	−0.8892
	7	0.2692	1.00	0.066	94 51	6 19.4	249 38	16 38.5	0.6918	1.2773	7.70	0.8867
	8	0.2719	0.99	0.066	94 51	6 19.4	248 35	16 34.3	0.6905	1.2778	7.66	0.8842
	9	0.2746	1.00	0.066	94 54	6 19.6	247 33	16 30.2	0.6909	1.2782	7.61	0.8814
	10	0.2774	1.01	0.067	94 53	6 19.5	246 30	16 26.0	0.6929	1.2787	7.56	0.8785
	11	0.2801	−0.98	−0.066	94 44	6 18.9	245 28	16 21.9	+0.6960	+1.2792	−7.51	−0.8755
	12	0.2828	0.93	0.062	94 25	6 17.7	244 25	16 17.7	0.6998	1.2796	7.45	0.8723
	13	0.2856	0.83	0.055	93 54	6 15.6	243 23	16 13.5	0.7036	1.2801	7.40	0.8689
	14	0.2883	0.70	0.046	93 13	6 12.9	242 21	16 9.4	0.7066	1.2807	7.34	0.8655
	15	0.2911	0.54	0.036	92 25	6 9.7	241 20	16 5.3	0.7084	1.2812	7.27	0.8618
	16	0.2938	−0.37	−0.024	91 35	6 6.3	240 18	16 1.2	+0.7088	+1.2817	−7.21	−0.8580
	17	0.2965	0.20	0.013	90 47	6 3.1	239 17	15 57.1	0.7077	1.2823	7.15	0.8541
	18	0.2993	−0.06	−0.004	90 5	6 0.3	238 16	15 53.1	0.7056	1.2829	7.08	0.8499
	19	0.3020	+0.06	+0.004	89 32	5 58.1	237 15	15 49.0	0.7030	1.2834	7.01	0.8456
	20	0.3047	0.13	0.009	89 8	5 56.6	236 14	15 44.9	0.7006	1.2840	6.94	0.8412
h (14.0)	21	0.3075	+0.18	+0.012	88 54	5 55.6	235 14	15 40.9	+0.6989	+1.2846	−6.87	−0.8367
	22	0.3102	0.21	0 014	88 44	5 54.9	234 13	15 36.9	0.6987	1.2852	6.79	0.8319
	23	0.3130	0.24	0.016	88 36	5 54.4	233 13	15 32.9	0.7000	1.2858	6.71	0.8269
	24	0.3157	0.29	0.019	88 23	5 53.5	232 13	15 28.9	0.7028	1.2865	6.63	0.8217
	25	0.3184	0.36	0.024	88 2	5 52.1	231 14	15 24.9	0.7068	1 2871	6.55	0.8164
	26	0.3212	+0.48	+0.031	87 30	5 50.0	230 14	15 20.9	+0.7113	+1.2877	−6.47	−0.8109
	27	0.3239	0.63	0.042	86 47	5 47.1	229 15	15 17.0	0.7156	1.2883	6.38	0.8051
	28	0.3266	0.81	0.054	85 56	5 43.7	228 16	15 13.1	0.7192	1.2889	6.30	0.7992
	29	0.3294	1.02	0.068	84 59	5 39.9	227 17	15 9.1	0.7216	1.2896	6.21	0.7931
	30	0.3321	1.22	0.081	84 2	5 36.1	226 18	15 5.2	0.7226	1.2902	6.12	0.7867
May	1	0.3349	+1.41	+0.093	83 9	5 32.6	225 19	15 1.3	+0.7223	+1.2908	−6.03	−0.7802
	2	0.3376	1.56	0.104	82 23	5 29.5	224 21	14 57.4	0.7209	1.2915	5.94	0.7734
	3	0.3403	1.67	0.112	81 48	5 27.2	223 23	14 53.5	0.7191	1.2921	5.84	0.7665
	4	0.3431	1.75	0.117	81 25	5 25.7	222 25	14 49.7	0.7175	1.2927	5.74	0.7592
	5	0.3458	1.79	0.119	81 12	5 24.8	221 27	14 45.8	0.7166	1.2934	5.65	0.7517
h (15.0)	6	0.3486	+1.82	+0.121	81 4	5 24.3	220 30	14 42.0	+0.7171	+1.2940	−5.55	−0.7440
	7	0.3513	1.84	0.123	80 59	5 23.9	219 33	14 38.2	0.7190	1.2946	5.45	0.7360
	8	0.3540	1.89	0.126	80 50	5 23.3	218 35	14 34.3	0.7224	1.2952	5.34	0.7277
	9	0.3568	1.97	0.131	80 34	5 22.3	217 38	14 30.5	0.7267	1.2959	5.24	0.7191
	10	0.3595	2.08	0.139	80 7	5 20.5	216 41	14 26.7	0.7315	1.2965	5.13	0.7102
	11	0.3622	+2.24	+0.149	79 30	5 18.0	215 45	14 23.0	+0.7361	+1.2971	−5.03	−0.7011
	12	0.3650	2.43	0.162	78 44	5 14.9	214 49	14 19.3	0.7398	1.2977	4.92	0.6917
	13	0.3677	2.63	0.175	77 52	5 11.5	213 52	14 15.5	0.7424	1.2982	4.81	0.6818
	14	0.3705	2.83	0.189	76 58	5 7.9	212 56	14 11.7	0.7436	1.2988	4.70	0.6717
	15	0.3732	3.02	0.201	76 6	5 4.4	212 0	14 8.0	0.7437	1.2994	4.58	0.6611
	16	0.3759	+3.17	+0.211	75 21	5 1.4	211 5	14 4.3	+0.7428	+1.3000	−4.47	−0.6502
	17	0.3787	+3.30	+0.220	74 44	4 58.9	210 9	14 0.6	+0.7416	+1.3005	−4.35	−0.6389

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)		τ	f		G		H		Log g.	Log h.	i	Log i.
			In Arc.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
		y	″	s	° ′	h m	° ′	h m			″	
May	17	0.3787	+3.30	+0.220	74 44	4 58.9	210 9	14 0.6	+0.7416	+1.3005	−4.35	−0.6389
	18	0.3814	3.39	0.226	74 17	4 57.1	209 14	13 56.9	0.7406	1.3010	4.24	0.6271
	19	0.3841	3.46	0.231	73 57	4 55.8	208 19	13 53.2	0.7405	1.3016	4.12	0.6149
	20	0.3869	3.52	0.234	73 42	4 54.8	207 24	13 49.5	0.7416	1.3021	4.00	0.6024
h (16.0)	21	0.3896	3.59	0.239	73 28	4 53.9	206 29	13 45.9	0.7442	1.3026	3.88	0.5892
	22	0.3924	+3.69	+0.246	73 10	4 52.7	205 34	13 42.3	+0.7480	+1.3031	−3.76	−0.5755
	23	0.3951	3.82	0.255	72 43	4 50.9	204 39	13 38.6	0.7528	1.3036	3.64	0.5612
	24	0.3978	4.00	0.267	72 8	4 48.5	203 45	13 35.0	0.7579	1.3041	3.52	0.5464
	25	0.4006	4.21	0.280	71 24	4 45.6	202 50	13 31.3	0.7628	1.3045	3.40	0.5309
	26	0.4033	4.44	0.295	70 32	4 42.1	201 56	13 27.7	0.7668	1.3050	3.27	0.5147
	27	0.4060	+4.68	+0.311	69 35	4 38.3	201 2	13 24.1	+0.7697	+1.3054	−3.15	−0.4978
	28	0.4088	4.90	0.326	68 39	4 34.6	200 8	13 20.5	0.7714	1.3058	3.02	0.4800
	29	0.4115	5.10	0.340	67 46	4 31.1	199 14	13 16.9	0.7719	1.3062	2.89	0.4613
	30	0.4143	5.26	0.351	67 1	4 28.1	198 20	13 13.3	0.7714	1.3066	2.77	0.4417
	31	0.4170	5.38	0.359	66 26	4 25.8	197 27	13 9.8	0.7705	1.3069	2.64	0.4211
June	1	0.4197	+5.46	+0.364	66 1	4 24.1	196 33	13 6.2	+0.7699	+1.3073	−2.51	−0.3993
	2	0.4225	5.52	0.368	65 44	4 23.0	195 40	13 2.7	0.7699	1.3076	2.38	0.3762
	3	0.4252	5.57	0.371	65 34	4 22.3	194 46	12 59.1	0.7711	1.3080	2.25	0.3518
	4	0.4279	5.64	0.376	65 25	4 21.7	193 53	12 55.5	0.7736	1.3083	2.12	0.3256
h (17.0)	5	0.4307	5.73	0.382	65 12	4 20.8	193 0	12 52.0	0.7772	1.3085	1.99	0.2979
	6	0.4334	+5.86	+0.391	64 52	4 19.5	192 7	12 48.5	+0.7817	+1.3088	−1.85	−0.2681
	7	0.4362	6.03	0.402	64 24	4 17.6	191 14	12 44.9	0.7864	1.3090	1.72	0.2358
	8	0.4389	6.24	0.416	63 46	4 15.1	190 21	12 41.4	0.7908	1.3093	1.59	0.2008
	9	0.4416	6.46	0.431	63 0	4 12.0	189 28	12 37.9	0.7945	1.3095	1.46	0.1628
	10	0.4444	6.69	0.446	62 9	4 8.6	188 35	12 34.3	0.7971	1.3097	1.32	0.1209
	11	0.4471	+6.90	+0.460	61 17	4 5.1	187 42	12 30.8	+0.7985	+1.3099	−1.19	−0.0744
	12	0.4499	7.09	0.473	60 28	4 1.8	186 50	12 27.3	0.7989	1.3100	1.05	0.0222
	13	0.4526	7.24	0.483	59 44	3 58.9	185 57	12 23.8	0.7986	1.3102	0.92	9.9628
	14	0.4553	7.36	0.491	59 9	3 56.6	185 4	12 20.3	0.7980	1.3103	0.78	9.8938
	15	0.4581	7.46	0.497	58 42	3 54.8	184 12	12 16.8	0.7978	1.3104	0.65	9.8116
	16	0.4608	+7.54	+0.503	58 22	3 53.5	183 19	12 13.3	+0.7984	+1.3105	−0.51	−9.7101
	17	0.4635	7.62	0.508	58 6	3 52.4	182 26	12 9.8	0.8000	1.3105	0.38	9.5775
	18	0.4663	7.73	0.515	57 51	3 51.4	181 34	12 6.3	0.8029	1.3106	0.24	9.3838
	19	0.4690	7.86	0.524	57 33	3 50.2	180 41	12 2.8	0.8069	1.3106	−0.11	−9.0294
h (18.0)	20	0.4718	8.04	0.536	57 8	3 48.5	179 49	11 59.3	0.8115	1.3106	+0.02	+8.1462
	21	0.4745	+8.25	+0.550	56 35	3 46.3	178 56	11 55.8	+0.8163	+1.3106	+0.16	+9.2148
	22	0.4772	8.49	0.566	55 54	3 43.6	178 4	11 52.3	0.8209	1.3106	0.30	9.4771
	23	0.4800	8.74	0.583	55 6	3 40.4	177 11	11 48.8	0.8246	1.3105	0.44	9.6385
	24	0.4827	8.98	0.599	54 15	3 37.0	176 19	11 45.3	0.8273	1.3104	0.57	9.7559
	25	0.4854	9.20	0.613	53 24	3 33 6	175 26	11 41.8	0.8289	1.3103	0.71	9.8482
	26	0.4882	+9.38	+0.626	52 36	3 30.4	174 34	11 38.3	+0.8294	+1.3102	+0.84	+9.9243
	27	0.4909	9.52	0.635	51 56	3 27.7	173 41	11 34.8	0.8291	1.3101	0.98	9.9890
	28	0.4937	9.62	0.642	51 24	3 25.6	172 49	11 31.3	0.8286	1.3100	1.11	0.0449
	29	0.4964	9.69	0.646	51 2	3 24.1	171 56	11 27.7	0.8282	1.3098	1.24	0.0944
	30	0.4991	9.75	0.650	50 47	3 23.1	171 3	11 24.2	0.8285	1.3096	1.38	0.1388
	31	0.5019	+9.82	+0.654	50 37	3 22.5	170 11	11 20.7	+0.8298	+1.3094	+1.51	+0.1788
	32	0.5046	+9.90	+0.660	50 28	3 21 9	169 18	11 17.2	+0.8322	+1.3092	+1.64	+0.2155

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)		τ	f		G		H		Log g.	Log h.	i	Log i.
			In Arc.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
		d	″	s	° ′	h m	° ′	h m			″	
July	1	0.5019	+ 9.82	+0.654	50 37	3 22.5	170 11	11 20.7	+0.8298	+1.3094	+1.51	+0.1788
	2	0.5046	9.90	0.660	50 28	3 21.9	169 18	11 17.2	0.8322	1.3092	1.64	0.2155
	3	0.5073	10.02	0.669	50 16	3 21.1	168 25	11 13.7	0.8355	1.3089	1.78	0.2492
	4	0.5101	10.18	0.680	49 57	3 19.8	167 32	11 10.1	0.8394	1.3087	1.91	0.2803
	5	0.5128	10.37	0.693	49 30	3 18.0	166 39	11 6.6	0.8435	1.3084	2.04	0.3093
($19^h.0$)	6	0.5156	+10.59	+0.707	48 55	3 15.7	165 46	11 3.1	+0.8472	+1.3081	+2.17	+0.3363
	7	0.5183	10.81	0.720	48 13	3 12.9	164 53	10 59.5	0.8503	1.3078	2.30	0.3616
	8	0.5210	11.03	0.734	47 28	3 9.9	164 0	10 56.0	0.8525	1.3075	2.43	0.3854
	9	0.5238	11.22	0.747	46 41	3 6.7	163 6	10 52.4	0.8536	1.3072	2.56	0.4079
	10	0.5265	11.37	0.758	45 58	3 3.9	162 13	10 48.9	0.8539	1.3068	2.69	0.4292
	11	0.5293	+11.49	+0.767	45 21	3 1.4	161 20	10 45.3	+0.8536	+1.3064	+2.81	+0.4493
	12	0.5320	11.58	0.773	44 51	2 59.4	160 26	10 41.7	0.8532	1.3061	2.94	0.4685
	13	0.5347	11.66	0.776	44 29	2 57.9	159 32	10 38.1	0.8532	1.3057	3.07	0.4866
	14	0.5375	11.73	0.781	44 13	2 56.9	158 39	10 34.6	0.8538	1.3052	3.19	0.5040
	15	0.5402	11.81	0.787	44 2	2 56.1	157 45	10 31.0	0.8555	1.3048	3.32	0.5206
	16	0.5429	+11.92	+0.796	43 50	2 55.3	156 51	10 27.4	+0.8582	+1.3044	+3.44	+0.5364
	17	0.5457	12.07	0.806	43 35	2 54.3	155 57	10 23.8	0.8618	1.3039	3.56	0.5516
	18	0.5484	12.26	0.818	43 14	2 52.9	155 3	10 20.2	0.8659	1.3034	3.68	0.5661
	19	0.5512	12.48	0.832	42 46	2 51.1	154 8	10 16.5	0.8701	1.3030	3.80	0.5802
	20	0.5539	12.71	0.847	42 10	2 48.7	153 13	10 12.9	0.8740	1.3025	3.92	0.5936
($20^h.0$)	21	0.5566	+12.94	+0.862	41 29	2 45.9	152 19	10 9.3	+0.8771	+1.3019	+4.04	+0.6065
	22	0.5594	13.14	0.876	40 45	2 43.0	151 24	10 5.6	0.8792	1.3014	4.16	0.6189
	23	0.5621	13.32	0.887	40 2	2 40.1	150 29	10 1.9	0.8802	1.3009	4.27	0.6308
	24	0.5648	13.45	0.896	39 22	2 37.5	149 34	9 58.3	0.8804	1.3004	4.39	0.6424
	25	0.5676	13.54	0.903	38 50	2 35.3	148 39	9 54.6	0.8800	1.2998	4.50	0.6535
	26	0.5703	+13.60	+0.907	38 26	2 33.7	147 44	9 50.9	+0.8794	+1.2992	+4.62	+0.6642
	27	0.5731	13.64	0.909	38 10	2 32.7	146 48	9 47.2	0.8790	1.2987	4.73	0.6746
	28	0.5758	13.68	0.910	38 1	2 32.1	145 52	9 43.5	0.8793	1.2981	4.84	0.6845
	29	0.5785	13.73	0.914	37 55	2 31.7	144 56	9 39.7	0.8804	1.2975	4.95	0.6942
	30	0.5813	13.81	0.920	37 50	2 31.3	144 0	9 36.0	0.8824	1.2969	5.05	0.7035
	31	0.5840	+13.93	+0.929	37 41	2 30.7	143 4	9 32.3	+0.8853	+1.2963	+5.16	+0.7125
Aug.	1	0.5867	14.08	0.940	37 25	2 29.7	142 8	9 28.5	0.8886	1.2957	5.26	0.7212
	2	0.5895	14.27	0.952	37 3	2 28.2	141 11	9 24.7	0.8920	1.2951	5.37	0.7297
	3	0.5922	14.46	0.965	36 33	2 26.2	140 15	9 21.0	0.8950	1.2945	5.47	0.7378
	4	0.5950	14.65	0.977	35 57	2 23.8	139 18	9 17.2	0.8974	1.2939	5.57	0.7457
($21^h.0$)	5	0.5977	+14.82	+0.988	35 19	2 21.3	138 21	9 13.4	+0.8990	+1.2932	+5.67	+0.7533
	6	0.6004	14.96	0.997	34 41	2 18.7	137 24	9 9.6	0.8998	1.2926	5.76	0.7606
	7	0.6032	15.06	1.004	34 7	2 16.5	136 26	9 5.7	0.8998	1.2920	5.86	0.7678
	8	0.6059	15.13	1.009	33 39	2 14.6	135 29	9 1.9	0.8993	1.2914	5.95	0.7746
	9	0.6087	15.17	1.012	33 18	2 13.2	134 31	8 58.1	0.8987	1.2907	6.04	0.7813
	10	0.6114	+15.21	+1.014	33 4	2 12.3	133 33	8 54.2	+0.8986	+1.2901	+6 13	+0.7878
	11	0.6141	15.25	1.017	32 57	2 11.8	132 34	8 50.3	0.8992	1.2895	6.22	0.7940
	12	0.6169	15.32	1.022	32 52	2 11.5	131 36	8 46.4	0.9008	1.2888	6.31	0.8000
	13	0.6196	15.43	1.029	32 46	2 11.1	130 37	8 42.5	0.9033	1.2882	6.40	0.8059
	14	0.6223	15.57	1.038	32 37	2 10.5	129 39	8 38.6	0.9065	1.2876	6.48	0.8116
	15	0.6251	+15.75	+1.050	32 22	2 9.5	128 40	8 34.7	+0.9101	+1.2870	+6.56	+0.8170
	16	0.6278	+15.94	+1.063	31 59	2 7.9	127 41	8 30.7	+0.9137	+1.2864	+6.64	+0.8223

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)		τ	f		G		H		Log g.	Log h.	i	Log i.
			In Arc.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
		y	″	s	° ′	h m	° ′	h m			″	
Aug.	16	0.6278	+15.94	+1.063	31 59	2 7.9	127 41	8 30.7	+0.9137	+1.2864	+6.64	+0.8223
	17	0.6306	16.14	1.076	31 31	2 6.1	126 41	8 26.7	0.9168	1.2858	6.72	0.8273
	18	0.6333	16.33	1.088	30 57	2 3.8	125 42	8 22.8	0.9192	1.2852	6.80	0.8322
	19	0.6360	16.48	1.099	30 23	2 1.5	124 42	8 18.8	0.9207	1.2846	6.87	0.8369
	20	0.6388	16.60	1.106	29 49	1 59.3	123 42	8 14.8	0.9213	1.2840	6.94	0.8415
(h 22.0)	21	0.6415	+16.67	+1.111	29 21	1 57.4	122 42	8 10.8	+0.9211	+1.2834	+7.01	+0.8459
	22	0.6442	16.70	1.113	28 59	1 55.9	121 42	8 6.8	0.9204	1.2828	7.08	0.8501
	23	0.6470	16.71	1.114	28 45	1 55.0	120 41	8 2.7	0.9197	1.2823	7.15	0.8542
	24	0.6497	16.71	1.114	28 39	1 54.6	119 41	7 58.7	0.9194	1.2817	7.21	0.8581
	25	0.6525	16.72	1.115	28 38	1 54.5	118 40	7 54.7	0.9196	1.2812	7.28	0.8618
	26	0.6552	+16.76	+1.118	28 39	1 54.6	117 39	7 50.6	+0.9207	+1.2807	+7.34	+0.8654
	27	0.6579	16.84	1.123	28 39	1 54.6	116 38	7 46.5	0.9226	1.2801	7.40	0.8689
	28	0.6607	16.95	1.130	28 36	1 54.4	115 37	7 42.5	0.9252	1.2796	7.45	0.8722
	29	0.6634	17.09	1.140	28 25	1 53.7	114 35	7 38.4	0.9282	1.2792	7.51	0.8754
	30	0.6661	17.25	1.150	28 8	1 52.5	113 34	7 34.3	0.9311	1.2787	7.56	0.8784
	31	0.6689	+17.42	+1.161	27 45	1 51.0	112 32	7 30.1	+0.9336	+1.2782	+7.61	+0.8812
Sept.	1	0.6716	17.56	1.171	27 17	1 49.1	111 30	7 26.0	0.9354	1.2778	7.65	0.8839
	2	0.6744	17.68	1.179	26 48	1 47.2	110 28	7 21.9	0.9364	1.2774	7.70	0.8865
	3	0.6771	17.76	1.184	26 21	1 45.4	109 25	7 17.7	0.9367	1.2770	7.75	0.8890
	4	0.6798	17.81	1.187	25 58	1 43.9	108 23	7 13.5	0.9364	1.2766	7.79	0.8913
(h 23.0)	5	0.6826	+17.83	+1.189	25 41	1 42.7	107 20	7 9.3	+0.9359	+1.2762	+7.82	+0.8934
	6	0.6853	17.84	1.189	25 32	1 42.1	106 18	7 5.2	0.9356	1.2759	7.86	0.8955
	7	0.6881	17.85	1.190	25 29	1 41.9	105 15	7 1.0	0.9358	1.2755	7.90	0.8974
	8	0.6908	17.89	1.192	25 31	1 42.1	104 12	6 56.8	0.9366	1.2752	7.93	0.8992
	9	0.6935	17.95	1.197	25 34	1 42.3	103 9	6 52.6	0.9384	1.2749	7.96	0.9008
	10	0.6963	+18.06	+1.204	25 35	1 42.3	102 6	6 48.4	+0.9411	+1.2746	+7.99	+0.9023
	11	0.6990	18.20	1.213	25 32	1 42.1	101 2	6 44.1	0.9442	1.2744	8.01	0.9037
	12	0.7017	18.36	1.224	25 23	1 41.5	99 59	6 39.9	0.9476	1.2742	8.03	0.9049
	13	0.7045	18.54	1.236	25 7	1 40.5	98 56	6 35.7	0.9508	1.2740	8.05	0.9061
	14	0.7072	18.71	1.247	24 45	1 39.1	97 52	6 31.5	0.9535	1.2738	8.07	0.9071
	15	0.7100	+18.86	+1.257	24 21	1 37.4	96 48	6 27.2	+0.9554	+1.2736	+8.09	+0.9080
	16	0.7127	18.96	1.264	23 56	1 35.7	95 45	6 23.0	0.9565	1.2735	8.11	0.9088
	17	0.7154	19.03	1.269	23 34	1 34.3	94 41	6 18.7	0.9568	1.2734	8.12	0.9094
	18	0.7182	19.06	1.270	23 18	1 33.2	93 37	6 14.5	0.9565	1.2733	8.13	0.9099
	19	0.7209	19.06	1.270	23 8	1 32.5	92 33	6 10.2	0.9559	1.2732	8.13	0.9102
(h 0.0)	20	0.7236	+19.04	+1.269	23 6	1 32.4	91 29	6 5.9	+0.9555	+1.2732	+8.14	+0.9105
	21	0.7264	19.03	1.269	23 10	1 32.7	90 25	6 1.7	0.9556	1.2731	8.14	0.9106
	22	0.7291	19.05	1.270	23 17	1 33.2	89 21	5 57.4	0.9563	1.2731	8.14	0.9105
	23	0.7319	19.10	1.273	23 25	1 33.7	88 17	5 53.1	0.9579	1.2732	8.14	0.9104
	24	0.7346	19.18	1.279	23 31	1 34.1	87 12	5 48.8	0.9602	1.2732	8.13	0.9101
	25	0.7373	+19.31	+1.287	23 32	1 34.1	86 8	5 44.5	+0.9629	+1.2733	+8.12	+0.9097
	26	0.7401	19.45	1.297	23 26	1 33.7	85 4	5 40.3	0.9659	1.2734	8.11	0.9092
	27	0.7428	19.61	1.307	23 13	1 32.9	84 0	5 36.0	0.9686	1.2735	8.10	0.9085
	28	0.7455	19.75	1.317	22 56	1 31.7	82 56	5 31.7	0.9709	1.2736	8.09	0.9077
	29	0.7483	19.87	1.325	22 36	1 30.4	81 52	5 27.5	0.9725	1.2738	8.07	0.9068
	30	0.7510	+19.96	+1.331	22 17	1 29.1	80 48	5 23.2	+0.9734	+1.2740	+8.05	+0.9059
	31	0.7538	+20.01	+1.334	22 0	1 28.0	79 43	5 18.9	+0 9737	+1.2742	+8.03	+0.9047

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)		τ	f		G		H		Log g.	Log h.	i	Log i.
			In Arc.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
		y	″	s	° ′	h m	° ′	h m			″	
Oct.	1	0.7538	+20.01	+1.334	22 0	1 28.0	79 43	5 18.9	+0.9737	+1.2742	+8.03	+0.9047
	2	0.7565	20.04	1.336	21 49	1 27.3	78 39	5 14.6	0.9736	1.2745	8.01	0.9034
	3	0.7592	20.05	1.336	21 44	1 26.9	77 35	5 10.3	0.9736	1.2747	7.98	0.9019
	4	0.7620	20.05	1.337	21 45	1 27.0	76 31	5 6.1	0.9738	1.2750	7.95	0.9003
h (1.0)	5	0.7647	20.08	1.339	21 52	1 27.5	75 27	5 1.8	0.9747	1.2753	7.92	0.8986
	6	0.7675	+20.13	+1.342	22 1	1 28.1	74 23	4 57.5	+0.9763	+1.2756	+7.88	+0.8967
	7	0.7702	20.23	1.349	22 10	1 28.7	73 20	4 53.3	0.9788	1.2760	7.85	0.8947
	8	0.7729	20.36	1.358	22 15	1 29.0	72 16	4 49.1	0.9820	1.2764	7.81	0.8926
	9	0.7757	20.53	1.369	22 15	1 29.0	71 12	4 44.8	0.9855	1.2767	7.77	0.8903
	10	0.7784	20.71	1.381	22 8	1 28.5	70 9	4 40.6	0.9890	1.2771	7.73	0.8879
	11	0.7811	+20.89	+1.393	21 56	1 27.7	69 5	4 36.3	+0.9922	+1.2776	+7.68	+0.8854
	12	0.7839	21.06	1.404	21 40	1 26.7	68 2	4 32.1	0.9948	1.2780	7.63	0.8827
	13	0.7866	21.19	1.413	21 23	1 25.5	66 58	4 27.9	0.9966	1.2784	7.58	0.8798
	14	0.7894	21.28	1.419	21 6	1 24.4	65 55	4 23.7	0.9977	1.2789	7.53	0.8768
	15	0.7921	21.34	1.423	20 54	1 23.6	64 52	4 19.5	0.9982	1.2794	7.48	0.8737
	16	0.7948	+21.36	+1.424	20 48	1 23.2	63 49	4 15.3	+0.9983	+1.2799	+7.42	+0.8703
	17	0.7976	21.36	1.424	20 48	1 23.2	62 46	4 11.1	0.9983	1.2805	7.36	0.8668
	18	0.8003	21.36	1.425	20 54	1 23.6	61 43	4 6.9	0.9987	1.2810	7.30	0.8632
	19	0.8030	21.39	1.426	21 4	1 24.3	60 40	4 2.7	0.9997	1.2816	7.24	0.8594
h (2.0)	20	0.8058	21.45	1.430	21 15	1 25.0	59 38	3 58.5	1.0014	1.2821	7.17	0.8554
	21	0.8085	+21.54	+1.436	21 26	1 25.7	58 35	3 54.3	+1.0039	+1.2827	+7.10	+0.8513
	22	0.8113	21.67	1.445	21 32	1 26.1	57 33	3 50.2	1.0068	1.2833	7.03	0.8470
	23	0.8140	21.83	1.456	21 33	1 26.2	56 31	3 46.1	1.0101	1.2839	6.96	0.8425
	24	0.8167	22.01	1.468	21 28	1 25.9	55 29	3 41.9	1.0133	1.2845	6.88	0.8378
	25	0.8195	22.18	1.479	21 17	1 25.1	54 27	3 37.8	1.0162	1.2851	6.81	0.8329
	26	0.8222	+22.34	+1.489	21 3	1 24.2	53 25	3 33.7	+1.0185	+1.2857	+6.73	+0.8278
	27	0.8249	22.46	1.498	20 48	1 23.2	52 23	3 29.5	1.0202	1.2863	6.65	0.8226
	28	0.8277	22.55	1.504	20 34	1 22.3	51 22	3 25.5	1.0213	1.2870	6.57	0.8172
	29	0.8304	22.61	1.508	20 25	1 21.7	50 21	3 21.4	1.0220	1.2876	6.48	0.8115
	30	0.8332	22.65	1.510	20 21	1 21.4	49 20	3 17.3	1.0225	1.2883	6.39	0.8056
	31	0.8359	+22.68	+1.513	20 22	1 21.5	48 19	3 13.3	+1.0233	+1.2889	+6.30	+0.7995
Nov.	1	0.8386	22.73	1.516	20 29	1 21.9	47 18	3 9.2	1.0245	1.2896	6.21	0.7932
	2	0.8414	22.81	1.521	20 38	1 22.5	46 17	3 5.1	1.0264	1.2902	6.12	0.7866
	3	0.8441	22.92	1.528	20 48	1 23.2	45 17	3 1.1	1.0290	1.2909	6.02	0.7799
h (3.0)	4	0.8469	23.08	1.538	20 56	1 23.7	44 16	2 57.1	1.0323	1.2915	5.93	0.7728
	5	0.8496	+23.27	+1.551	20 59	1 23.9	43 16	2 53.1	+1.0360	+1.2922	+5.83	+0.7655
	6	0.8523	23.48	1.566	20 56	1 23.7	42 16	2 49.1	1.0398	1.2929	5.73	0.7580
	7	0.8551	23.70	1.581	20 48	1 23.2	41 16	2 45.1	1.0435	1.2935	5.63	0.7501
	8	0.8578	23.91	1.594	20 35	1 22.3	40 16	2 41.1	1.0467	1.2942	5.52	0.7421
	9	0.8605	24.09	1.606	20 21	1 21.4	39 16	2 37.1	1.0492	1.2948	5.42	0.7337
	10	0.8633	+24.23	+1.616	20 6	1 20.4	38 17	2 33.1	+1.0511	+1.2955	+5.31	+0.7249
	11	0.8660	24.33	1.623	19 54	1 19.6	37 18	2 29.2	1.0524	1.2961	5.20	0.7159
	12	0.8688	24.40	1.627	19 46	1 19.1	36 18	2 25.2	1.0532	1.2967	5.09	0.7066
	13	0.8715	24.45	1.630	19 43	1 18.9	35 19	2 21.3	1.0539	1.2973	4.98	0.6968
	14	0.8742	24.49	1.633	19 46	1 19.1	34 20	2 17.3	1.0548	1.2980	4.86	0.6867
	15	0.8770	+24.55	+1.637	19 54	1 19.6	33 22	2 13.4	+1.0561	+1.2986	+4.75	+0.6763
	16	0.8797	+24.63	+1.642	20 3	1 20.2	32 23	2 9.5	+1.0580	+1.2992	+4.63	+0.6654

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)		τ	f		G		H		Log g.	Log h.	i	Log i.
			In Arc.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
		y	″	s	° ′	h m	° ′	h m			″	
Nov.	16	0.8797	+24.63	+1.642	20 3	1 20.2	32 23	2 9.5	+1.0580	+1.2992	+4.63	+0.6654
	17	0.8824	24.75	1.650	20 12	1 20.8	31 25	2 5.7	1.0605	1.2998	4.50	0.6541
	18	0.8852	24.91	1.661	20 18	1 21.2	30 26	2 1.7	1.0636	1.3004	4.39	0.6425
	19	0.8879	25.10	1.674	20 19	1 21.3	29 28	1 57.9	1.0670	1.3009	4.27	0.6302
h (4.0)	20	0.8907	25.31	1.688	20 15	1 21.0	28 30	1 54.0	1.0704	1.3015	4.15	0.6175
	21	0.8934	+25.53	+1.702	20 5	1 20.3	27 32	1 50.1	+1.0737	+1.3020	+4.02	+0.6043
	22	0.8961	25.73	1.715	19 52	1 19.5	26 34	1 46.3	1.0765	1.3026	3.90	0.5905
	23	0.8989	25.90	1.727	19 37	1 18.5	25 36	1 42.4	1.0787	1.3031	3.77	0.5762
	24	0.9016	26.04	1.736	19 23	1 17.5	24 39	1 38.6	1.0804	1.3036	3.64	0.5611
	25	0.9043	26.15	1.743	19 11	1 16.7	23 41	1 34.7	1.0816	1 3041	3.51	0.5455
	26	0.9071	+26.23	+1.748	19 3	1 16.2	22 44	1 30.9	+1.0826	+1.3046	+3.38	+0.5290
	27	0.9098	26.30	1.753	19 0	1 16.0	21 47	1 27.1	1.0837	1.3050	3.25	0.5118
	28	0.9126	26.38	1.758	19 2	1 16.1	20 49	1 23.3	1.0851	1.3055	3.12	0.4938
	29	0.9153	26.48	1.765	19 7	1 16.5	19 52	1 19.5	1.0870	1.3059	2.98	0.4748
	30	0.9180	26.62	1.775	19 13	1 16.9	18 55	1 15.7	1.0895	1.3063	2.85	0.4547
Dec.	1	0.9208	+26.80	+1.787	19 18	1 17.2	17 59	1 11.9	+1.0926	+1.3067	+2.71	+0.4335
	2	0.9235	27.02	1.800	19 19	1 17.3	17 2	1 8.1	1.0961	1.3071	2.58	0.4111
	3	0.9262	27.26	1.816	19 15	1 17.0	16 5	1 4.3	1.0999	1.3075	2.44	0.3874
	4	0.9290	27.52	1.833	19 7	1 16.5	15 8	1 0.5	1.1037	1.3078	2.30	0.3621
h (5.0)	5	0.9317	27.76	1.850	18 54	1 15.6	14 12	0 56.8	1.1070	1.3081	2.16	0.3351
	6	0.9345	+27.99	+1.865	18 38	1 14.5	13 15	0 53.0	+1.1097	+1.3084	+2.02	+0.3062
	7	0.9372	28.18	1.878	18 22	1 13.5	12 19	0 49.3	1.1119	1.3087	1.88	0.2749
	8	0.9399	28.33	1.888	18 7	1 12.5	11 22	0 45.5	1.1135	1.3090	1.74	0.2412
	9	0.9427	28.43	1.895	17 55	1 11.7	10 26	0 41.7	1.1147	1.3093	1.60	0.2045
	10	0.9454	28 52	1.900	17 47	1 11.1	9 30	0 38.0	1.1157	1.3095	1.46	0.1642
	11	0.9482	+28.59	+1.905	17 44	1 10.9	8 33	0 34.2	+1.1166	+1.3097	+1.32	+0.1196
	12	0.9509	28.67	1.910	17 46	1 11.1	7 37	0 30.5	1.1179	1.3099	1.18	0.0698
	13	0.9536	28.77	1.916	17 49	1 11.3	6 41	0 26.7	1.1196	1.3100	1.03	0.0132
	14	0.9564	28.90	1.927	17 54	1 11.6	5 45	0 23.0	1.1218	1.3102	0.89	9.9480
	15	0.9591	29.08	1.939	17 56	1 11.7	4 49	0 19.3	1.1244	1.3102	0.74	9.8711
	16	0.9618	+29.29	+1.952	17 55	1 11.7	3 53	0 15.5	+1.1275	+1.3104	+0.60	+9.7773
	17	0.9646	29.52	1.967	17 50	1 11.3	2 57	0 11.8	1.1307	1.3105	0.46	9.6590
	18	0.9673	29.75	1.983	17 39	1 10.6	2 1	0 8.1	1.1337	1.3105	0.31	9.4928
	19	0.9701	29.98	1.999	17 25	1 9.7	1 5	0 4.3	1.1364	1.3106	0.17	9.2201
h (6.0)	20	0 9728	30.18	2.012	17 9	1 8.6	0 8	0 0.5	1.1387	1.3106	+0.02	+8.0034
	21	0.9755	+30.35	+2.023	16 52	1 7.5	359 12	23 56.8	+1.1405	+1.3106	−0.12	−9.0899
	22	0.9783	30.48	2.032	16 36	1 6.4	358 16	23 53.1	1.1418	1.3105	0.27	9.4281
	23	0.9810	30.59	2.039	16 24	1 5.6	357 20	23 49.3	1.1428	1.3105	0.41	9.6150
	24	0.9837	30.67	2.045	16 16	1 5.1	356 24	23 45.6	1.1437	1.3104	0.56	9.7459
	25	0.9865	30.76	2.051	16 13	1 4.9	355 28	23 41.9	1.1448	1.3103	0.70	9.8457
	26	0.9892	+30.87	+2.058	16 12	1 4.8	354 32	23 38.1	+1.1463	+1.3102	−0.85	−9.9269
	27	0.9920	31.00	2.067	16 14	1 4.9	353 36	23 34.4	1.1482	1.3101	0.99	9.9952
	28	0.9947	31.18	2.078	16 15	1 5.0	352 39	23 30.6	1.1507	1.3099	1.13	0.0539
	29	0.9974	31.39	2.092	16 14	1 4.9	351 43	23 26.9	1.1536	1.3098	1.28	0.1059
	30	1.0002	31.63	2.109	16 9	1 4.6	350 47	23 23.1	1.1568	1.3096	1.42	0.1520
	31	1.0029	+31.89	+2.126	16 0	1 4.0	349 50	23 19.3	+1.1600	+1.3093	−1.56	−0.1934
	32	1.0056	+32.15	+2.143	15 47	1 3.1	348 54	23 15.6	+1.1630	+1.3091	−1.70	−0.2312

MEAN PLACES FOR 1888.0. (January 0^{d}.196, Washington.)

	Name of Star.		Magnitude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
				h m s	s	° ′ ″	″
	α Andromedæ		2.0	0 2 35.934	+ 3.0911	+ 28 28 19.31	+ 19.885
*	β Cassiopeæ		2.0	0 3 12.248	3.1733	+ 58 31 54.11	19.852
*	22 Andromedæ		5.3	0 4 30.075	3.1018	+ 45 26 55.62	20.036
	4 Draconis (H.)	S. P.	4.7	0 6 57.018	2.8877	+101 45 40.98	20.023
	γ Pegasi (*Algenib*)		2.7	0 7 28.120	3.0835	+ 14 33 39.00	20.024
*	σ Andromedæ		4.3	0 12 28.674	+ 3.1227	+ 36 9 50.98	+ 19.985
*	ι Ceti		3.3	0 13 43.122	3.0529	− 9 26 42.42	19.959
*	6 Ursæ Minoris	S. P.	6.0	0 14 20.080	0.1410	+ 91 40 44.69	19.941
*	44 Piscium		6.0	0 19 39.663	3.0729	+ 1 19 9.72	19.955
	β Hydri		3.0	0 19 51.082	3.2332	− 77 53 6.37	20.285
	12 Ceti		6.0	0 24 19.366	+ 3.0610	− 4 34 34.34	+ 19.939
	κ Draconis	S. P.	3.3	0 28 42.041	2.5926	+109 35 39.78	19.891
*	π Andromedæ		4.0	0 30 53.955	3.1903	+ 33 6 9.40	19.875
	α Cassiopeæ (*var.*)		2.5	0 34 9.303	3.3729	+ 55 55 22.45	19.790
	β Ceti		2.0	0 37 58.063	3.0143	− 18 36 5.72	19.803
	21 Cassiopeæ		6.0	0 38 15.507	+ 3.8552	+ 74 22 32.56	+ 19.754
*	o Cassiopeæ		5.0	0 38 29.106	3.3186	+ 47 40 16.24	19.756
*	δ Piscium		4.3	0 42 52.274	3.1069	+ 6 58 31.17	19.650
	32^{2} Camelop. (H.)	S. P.	4.7	0 48 18.675	0.3897	+ 95 58 42.05	19.597
*	γ Cassiopeæ		2.0	0 49 57.123	3.5780	+ 60 6 35.83	19.566
*	μ Andromedæ		4.0	0 50 32.233	+ 3.3106	+ 37 53 30.25	+ 19.619
*	43 Cephei (H.)		4.3	0 53 33.741	7.2152	+ 85 39 21.01	19.507
	ϵ Piscium		4.0	0 57 7.821	3.1089	+ 7 17 12.97	19.456
	β Andromedæ		2.3	1 3 27.737	3.3438	+ 35 1 35.39	19.167
*	κ Tucanæ		5.0	1 11 58.300	2.0557	− 69 28 15.49	19.170
*	f Piscium		5.0	1 12 1.282	+ 3.0898	+ 3 1 27.67	+ 19.037
	α Ursæ Minoris (*Polaris*)		2.0	1 17 44.827	22.9800	+ 88 42 40.60	18.910
	θ^{1} Ceti		3.0	1 18 25.495	2.9970	− 8 45 41.49	18.671
	38 Cassiopeæ		6.3	1 22 54.174	4.3757	+ 69 41 15.92	18.680
*	κ Octantis	S. P.	5.0	1 22 58.154	8.6470	− 94 47 19.88	18.785
	η Piscium		3.7	1 25 29.419	+ 3.2023	+ 14 46 5.46	+ 18.667
*	υ Andromedæ		4.0	1 30 13.517	3.5038	+ 40 50 42.28	18.150
*	π Piscium		5.7	1 31 9.663	3.1703	+ 11 34 6.32	18.530
	α Eridani (*Achernar*)		1.0	1 33 32.230	2.2326	− 57 48 21.53	18.359
*	ν Piscium		4.7	1 35 36.174	3.1174	+ 4 55 13.95	18.333
	o Piscium		4.3	1 39 28.771	+ 3.1621	+ 8 35 36.84	+ 18.220
*	ζ Ceti		3.0	1 45 55.924	2.9617	− 10 53 22.61	17.827
	β Arietis		3.0	1 48 27.182	3.3033	+ 20 15 36.64	17.732
	50 Cassiopeæ		4.0	1 53 52.821	5.0085	+ 71 52 43.61	17.651
*	γ Andromedæ		2.3	1 57 1.527	3.6598	+ 41 47 30.52	17.447
	α Arietis		2.0	2 0 51.605	+ 3.3707	+ 22 55 56.69	+ 17.177
	α Draconis	S. P.	3.3	2 1 21.483	1.6237	+115 5 19.69	17.301
*	β Trianguli		3.0	2 2 52.821	3.5539	+ 34 27 25.44	17.209
	ξ^{1} Ceti		4.3	2 7 3.839	+ 3.1739	+ 8 19 15.20	17.034
*	4 Ursæ Minoris	S. P.	5.0	2 9 17.670	− 0.3250	+101 55 34.14	16.908
*	γ Trianguli		4.3	2 10 39.405	+ 3.5504	+ 33 19 43.51	+ 16.850
*	67 Ceti		6.0	2 11 23.791	2.9894	− 6 56 19.67	16.736
	ι Cassiopeæ		4.0	2 19 50.427	4.8603	+ 66 53 53.33	16.439
*	δ Hydri		4.0	2 19 45.506	1.0542	− 69 10 8.85	16.450
	ξ^{2} Ceti		4.0	2 22 12.271	+ 3.1836	+ 7 57 27.14	+ 16.300

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MEAN PLACES FOR 1888.0. (January 0d.196, Washington.)

	Name of Star.		Magnitude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
				h m s	s	° ′ ″	″
	5 Ursæ Minoris	S. P.	4.7	2 27 46.180	− 0.1919	+103 48 22.13	+ 16.011
*	δ Ceti		4.0	2 33 44.523	+ 3.0728	− 0 9 19.10	15.702
*	μ Hydri		6.0	2 34 3.414	− 1.4391	− 79 35 51.60	15.680
*	θ Persei		4.0	2 36 33.129	+ 4.0690	+ 48 45 14.51	15.464
	γ Ceti		3.3	2 37 29.820	3.1031	+ 2 45 47.88	15.344
*	σ Arietis		5.7	2 45 18.552	+ 3.3043	+ 14 37 11.76	+ 15.013
	β Ursæ Minoris	S. P.	2.0	2 51 2.289	− 0.2325	+105 23 12.51	14.719
*	47 Cephei (H.)		6.0	2 51 13.390	+ 7.7152	+ 78 58 28.79	14.708
*	ε Arietis		4.3	2 52 48.486	3.4208	+ 20 53 30.70	14.611
	α Ceti		2.3	2 56 25.478	3.1302	+ 3 38 59.23	14.314
*	β Persei (*Algol*) (*var.*)		2.7	3 0 52.928	+ 3.8831	+ 40 31 24.07	+ 14.127
	48 Cephei (H.)		6.3	3 6 7.888	7.4018	+ 77 19 18.51	13.743
	ζ Arietis		4.7	3 8 27.836	3.4391	+ 20 37 43.48	13.562
	α Persei		2.0	3 16 19.746	4.2568	+ 49 27 42.14	13.100
*	ρ Octantis	S. P.	6.0	3 17 34.930	+12.9580	− 95 54 38.90	13.008
*	ι Hydri		5.0	3 18 45.867	− 1.6011	− 77 47 49.46	+ 13.027
	γ^2 Ursæ Minoris	S. P.	3.0	3 20 54.679	− 0.1347	+107 46 2.92	12.811
*	f Tauri		4.0	3 24 41.355	+ 3.3048	+ 12 33 8.09	12.570
	ε Eridani		3.0	3 27 39.213	2.8236	− 9 50 15.79	12.399
	δ Persei		3.3	3 34 57.151	4.2494	+ 47 25 42.55	11.818
*	γ Camelopardalis (H.)		4.3	3 38 32.646	+ 6.2361	+ 70 59 8.92	+ 11.556
	η Tauri		3.0	3 40 49.596	3.5556	+ 23 45 28.91	11.387
	ζ Persei		3.0	3 47 5.534	+ 3.7599	+ 31 33 0.39	10.957
	ζ Ursæ Minoris	S. P.	4.3	3 48 4.446	− 2.2543	+101 51 40.93	10.917
*	γ Hydri		3.3	3 48 58.749	− 0.9983	− 74 34 55.20	10.979
*	ε Persei		3.3	3 50 20.274	+ 4.0094	+ 39 41 7.10	+ 10.730
	γ Eridani		3.0	3 52 48.273	2.7985	− 13 49 39.84	10.451
*	A^1 Tauri		4.7	3 58 4.457	3.5397	+ 21 46 29.66	10.090
*	c Persei		4.0	4 0 31.896	4.3366	+ 47 24 44.87	9.950
	Groombr. 2320	S. P.	6.3	4 6 0.904	0.1392	+111 53 40.87	9.499
*	o^1 Eridani		4.3	4 6 23.897	+ 2.9264	− 7 7 49.24	+ 9.623
	γ Tauri		4.0	4 13 25.191	+ 3.4088	+ 15 21 23.16	8.965
*	η Ursæ Minoris	S. P.	5.0	4 20 47.104	− 1.8180	+103 59 12.71	8.159
	ε Tauri		3.7	4 22 4.593	+ 3.4973	+ 18 55 52.29	8.265
	η Draconis	S. P.	2.7	4 22 28.642	0.8061	+118 13 55.88	8.224
*	m Persei		6.0	4 25 32.128	+ 4.2097	+ 42 49 24.80	+ 8.016
*	δ Mensæ		6.0	4 25 34.379	− 4.2278	− 80 28 33.34	8.036
	A Draconis	S. P.	5.0	4 28 12.446	− 0.1355	+110 59 23.07	7.798
	α Tauri (*Aldebaran*)		1.0	4 29 29.639	+ 3.4372	+ 16 16 59.98	7.523
*	τ Tauri		4.3	4 35 31.367	3.5952	+ 22 44 28.09	7.193
	α Camelopardalis		4.7	4 42 54.966	+ 5.9240	+ 66 9 3.44	+ 6.617
*	i Tauri		5.3	4 44 49.334	3.5052	+ 18 38 53.93	6.414
	ι Aurigæ		3.0	4 49 42.014	3.9004	+ 32 59 16.18	6.034
*	ζ Aurigæ		4.0	4 54 38.973	+ 4.1848	+ 40 54 40.80	5.635
	ε Ursæ Minoris	S. P.	4.3	4 57 28.276	− 6.3360	+ 97 46 47.04	5.406
	11 Orionis		5.0	4 58 10.130	+ 3.4243	+ 15 14 50.08	+ 5.306
*	β Eridani		3.0	5 2 20.617	2.9483	− 5 13 54.91	4.933
	α Aurigæ (*Capella*)		1.0	5 8 24.941	4.4245	+ 45 52 58.62	4.041
	β Orionis (*Rigel*)		1.0	5 9 9.315	2.8812	− 8 19 54.33	4.406
*	τ Orionis		4.0	5 12 10.081	+ 2.9123	− 6 57 58.71	+ 4.144

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MEAN PLACES FOR 1888.0. (January 0^d.196, Washington.)

	Name of Star.	Magnitude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
			h m s	s	° ′ ″	″
	β Tauri	2.0	5 19 12.717	+ 3.7891	+ 28 30 42.75	+ 3.370
	Groombridge 966	6.3	5 24 45.555	7.9996	+ 74 58 3.56	3.091
*	χ Aurigæ	5.0	5 25 26.368	3.9048	+ 32 6 30.66	3.033
*	Groombridge 944	6.3	5 26 11.052	18.6430	+ 85 8 16.67	2.961
	δ Orionis (*var.*)	2.5	5 26 17.083	3.0633	− 0 22 58.19	2.935
	α Leporis	3.0	5 27 47.428	+ 2.6447	− 17 54 11.23	+ 2.809
	ϵ Orionis	2.0	5 30 31.809	3.0423	− 1 16 27.13	2.572
	α Columbæ	2.0	5 35 35.667	+ 2.1727	− 34 8 3.83	2.087
	ω Draconis S. P.	5.0	5 37 36.510	− 0.3540	+111 11 25.44	1.632
*	κ Orionis	2.7	5 42 26.651	+ 2.8447	− 9 42 36.53	1.538
*	ν Aurigæ	4.0	5 43 43.610	+ 4.1540	+ 39 6 52.57	+ 1.459
	ψ^1 Draconis S. P.	4.3	5 43 55.836	− 1.0794	+107 47 47.44	1.678
*	δ Doradus	4.3	5 44 34.544	+ 0.1048	− 65 46 38.87	1.329
	α Orionis (*var.*)	1.2	5 49 6.491	3.2469	+ 7 23 7.22	0.960
*	β Aurigæ	2.0	5 51 18.808	4.4015	+ 44 56 5.49	0.750
*	θ Aurigæ	3.0	5 52 5.071	+ 4.0918	+ 37 12 13.45	+ 0.604
	ν Orionis	4.7	6 1 10.689	3.4273	+ 14 46 51.42	− 0.133
	22 Camelopardalis (H.)	4.7	6 6 29.968	6.6175	+ 69 21 26.97	0.687
*	η Geminorum	3.3	6 8 7.054	+ 3.6227	+ 22 32 18.21	0.725
	δ Ursæ Minoris S. P.	4.3	6 8 26.569	−19.4620	+ 93 23 19.76	0.790
	μ Geminorum	3.0	6 16 11.111	+ 3.6315	+ 22 34 12.39	− 1.537
*	ψ^1 Aurigæ	5.3	6 16 16.364	4.6267	+ 49 20 37.98	1.434
	α Argus (*Canopus*)	1.0	6 21 28.026	1.3304	− 52 38 4.94	1.867
*	ν Geminorum	4.7	6 22 18.764	+ 3.5631	+ 20 16 55.59	1.971
*	χ Draconis S. P.	4.0	6 23 4.495	− 1.0791	+107 18 57.81	1.640
	γ Geminorum	2.3	6 31 14.507	+ 3.4674	+ 16 29 38.47	− 2.773
*	ϵ Geminorum	3.3	6 37 2.460	3.6936	+ 25 14 28.07	3.239
*	ψ^5 Aurigæ	5.7	6 38 39.918	4.3291	+ 43 41 16.19	3.220
†	α Canis Majoris (*Sirius*)	1.0	6 40 12.771	2.6437	− 16 33 47.30	4.708
*	θ Geminorum	3.3	6 45 24.450	3.9606	+ 34 5 43.52	3.979
	51 Cephei (H.)	5.3	6 47 45.601	+29.9400	+ 87 13 12.84	− 4.241
*	ζ Mensæ	5.8	6 49 21.363	− 4.8997	− 80 41 41.04	4.204
	50 Draconis S. P.	6.0	6 49 58.876	− 1.9072	+104 41 54.73	4.414
	ϵ Canis Majoris	1.7	6 54 13.473	+ 2.3577	− 28 49 13.12	4.713
*	ζ Geminorum (*var.*)	4.0	6 57 27.998	3.5627	+ 20 44 1.21	4.994
	δ Canis Majoris	2.0	7 3 50.239	+ 2.4385	− 26 12 57.07	− 5.504
*	63 Aurigæ	5.0	7 3 57.094	4.1368	+ 39 30 8.65	5.504
*	25 Camelopardalis	4.7	7 7 28.728	+12.9660	+ 82 37 28.18	5.851
*	γ^2 Volantis (*var.*)	4.7	7 9 41.575	− 0.4932	− 70 19 1.86	6.008
	δ Draconis S. P.	3.0	7 12 31.680	+ 0.0299	+112 32 7.71	6.326
	δ Geminorum	3.3	7 13 26.044	+ 3.5880	+ 22 11 15.70	− 6.332
	τ Draconis S. P.	4.7	7 17 42.254	− 1.1162	+106 51 9.70	6.778
	Piazzi vii. 67	6.0	7 19 13.391	+ 6.2999	+ 68 41 35.01	6.832
*	β Canis Minoris	3.0	7 21 4.634	3.2599	+ 8 30 51.05	6.984
	α^2 Geminorum (*Castor*)	1.7	7 27 27.255	3.8386	+ 32 8 0.25	7.545
†	α Canis Min. (*Procyon*)	1.0	7 33 26.335	+ 3.1435	+ 5 30 40.74	− 8.988
	λ Ursæ Minoris S. P.	6.3	7 35 44.175	−64.4780	+ 91 2 15.56	8.145
	β Geminorum (*Pollux*)	1.3	7 38 27.738	+ 3.6795	+ 28 17 45.28	8.409
*	26 Lyncis	6.0	7 46 33.322	4.3888	+ 47 51 14.02	9.012
	φ Geminorum	5.0	7 46 38.564	+ 3.6801	+ 27 3 17.85	− 9.022

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†Periodic corrections given in the Appendix are still to be applied to the positions of Sirius and Procyon.

MEAN PLACES FOR 1888.0. (January 0d.196, Washington.)

	Name of Star.		Magnitude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
				h m s	s	° ′ ″	″
*	Groombridge 1374		5.7	7 46 46.422	+ 7.2888	+ 74 12 55.87	— 9.051
	ε Draconis	S. P.	3.7	7 48 32.813	— 0.1786	+110 1 2.34	9.174
*	ω^1 Cancri		6.0	7 54 9.275	+ 3.6375	+ 25 41 55.70	9.573
	3 Ursæ Majoris (H.)		5.7	8 1 39.733	6.0507	+ 68 48 8.89	10.150
	15 Argus (ρ)		3.0	8 2 46.461	2.5544	— 23 58 54.93	10.190
*	ζ^1 Cancri		4.7	8 5 47.305	+ 3.4466	+ 17 59 3.34	— 10.597
*	β Cancri		3.7	8 10 26.463	+ 3.2589	+ 9 31 47.78	10.851
	κ Cephei (*pr.*)	S. P	4.3	8 12 38.803	— 1.9208	+102 37 34.40	10.998
*	30 Monocerotis		3.7	8 20 3.824	+ 3.0002	— 3 32 29.72	11.501
*	θ Chamæleontis		4.7	8 23 59.038	— 1.7080	— 77 7 22.01	11.764
	η Cancri		5.7	8 26 13.937	+ 3.4785	+ 20 49 15.47	— 11.998
	Groombr. 3241	S. P.	6.3	8 30 29.100	— 0.2189	+107 50 52.10	12.221
*	σ Hydræ		5.0	8 32 54.296	+ 3.1462	+ 3 44 2.47	12.429
*	γ Cancri		4.3	8 36 48.270	3.4808	+ 21 52 14.13	12.719
	ε Hydræ		3.3	8 40 50.705	3.1819	+ 6 49 44.88	13.000
*	σ^2 Cancri (*mean*)		5.7	8 47 24.633	+ 3.6738	+ 31 0 10.51	— 13.402
	ι Ursæ Majoris		3.0	8 51 32.200	+ 4.1340	+ 48 28 50.56	13.898
	12 Year Cat. 1879	S. P.	6.0	8 52 38.746	— 2.5446	+ 99 52 5.52	13.687
	σ^2 Ursæ Majoris		5.0	9 0 31.802	+ 5.3567	+ 67 35 18.31	14.268
	κ Cancri		5.0	9 1 40.878	3.2560	+ 11 7 6.46	14.286
*	θ Hydræ		4.0	9 8 32.257	+ 3.1265	+ 2 47 10.44	— 15.014
*	β Argus		1.5	9 11 58.057	0.6782	— 69 15 21.22	14.804
	ι Argus		2.0	9 14 5.372	1.6012	— 58 48 18.60	14.995
*	α Lyncis		3.3	9 14 13.810	3.6695	+ 34 51 55.52	15.021
	α Cephei	S. P.	2.7	9 15 54.383	1.4366	+117 53 19.89	15.171
	1 Draconis (H.)		4.3	9 21 3.761	+ 9.0105	+ 81 49 12.83	— 15.439
	α Hydræ		2.0	9 22 5.026	2.9491	— 8 10 24.90	15.448
	d Ursæ Majoris		4.7	9 24 33.920	5.4032	+ 70 19 18.44	15.555
	θ Ursæ Majoris		3.0	9 25 21.715	4.0419	+ 52 11 13.76	16.214
	β Cephei (*pr.*)	S. P.	3.0	9 27 12.716	0.7946	+109 55 51.43	15.755
*	10 Leonis Minoris		4.7	9 27 21.683	+ 3.6945	+ 36 53 39.60	— 15.778
*	ο Leonis		3.7	9 35 10.368	+ 3.2070	+ 10 24 5.04	16.218
*	ζ Chamæleontis		5.0	9 37 9.497	— 1.5582	— 80 26 16.40	16.289
	ε Leonis		3.0	9 39 29.601	+ 3.4153	+ 24 17 22.15	16.422
	11 Cephei	S. P.	5.0	9 40 16.830	0.9018	+109 12 15.03	16.538
	μ Leonis		4.0	9 46 23.596	+ 3.4223	+ 26 32 2.52	— 16.793
*	19 Leonis Minoris		5.3	9 50 49.413	3.6958	+ 41 35 18.78	16.957
	79 Draconis	S. P.	6.3	9 51 28.178	0.7298	+106 49 38.97	17.013
*	π Leonis		5.0	9 54 17.680	3.1743	+ 8 34 52.21	17.137
	α Leonis (*Regulus*)		1.3	10 2 24.428	3.2008	+ 12 30 51.31	17.472
	32 Ursæ Majoris		6.0	10 9 53.604	+ 4.4224	+ 65 39 59.34	— 17.809
*	λ Ursæ Majoris		3.3	10 10 20.403	3.6402	+ 43 28 22.91	17.870
	γ^1 Leonis		2.0	10 13 47.840	3.3151	+ 20 24 27.94	18.084
*	μ Hydræ		4.0	10 20 40.470	2.9005	— 16 15 54.37	18.309
*	β Leonis Minoris		4.3	10 21 24.347	3.4870	+ 37 16 51.02	18.314
*	α Antliæ		4.0	10 22 1.599	+ 2.7390	— 30 29 53.37	— 18.216
	9 Draconis (H.)		4.7	10 25 33.737	5.2668	+ 76 17 21.90	18.390
	ρ Leonis		4.0	10 26 54.855	3.1643	+ 9 52 57.42	18.430
	226 Cephei (B.)	S. P.	5.3	10 30 18.381	1.0779	+104 21 2.69	18.528
*	β Octantis	S. P.	4.7	10 34 33.510	+ 6.4940	— 98 1 55.31	— 18.677

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MEAN PLACES FOR 1888.0. (January 0^d.196, Washington.)

Name of Star.	Magnitude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
		h m s	s	° ′ ″	″
* 41 Leonis Minoris .	5.7	10 37 19.542	+ 3.2713	+ 23 46 28.18	— 18.735
η Argus (*var.*) . .	1–6	10 40 42.963	2.3131	— 59 5 44.96	18.869
l Leonis . . .	5.3	10 43 22.227	3.1586	+ 11 8 15.37	18.971
* δ^2 Chamæleontis . .	5.0	10 44 43.616	0.6391	— 79 56 59.08	18.981
ι Cephei . . S. P.	3.3	10 45 41.558	2.1215	+114 23 19.10	18.876
* 46 Leonis Minoris .	4.0	10 47 2.821	+ 3.3700	+ 34 49 7.08	— 19.293
* Groombridge 1706 .	6.0	10 50 58.401	4.9744	+ 78 22 11.83	19.178
α Ursæ Majoris . .	2.0	10 56 48.644	+ 3.7486	+ 62 21 19.72	19.362
* η Octantis . . .	6.0	11 0 5.359	— 0.2094	— 83 59 29.06	19.372
* p^3 Leonis . . .	6.0	11 1 11.445	+ 3.0622	+ 2 33 47.43	19.486
* ψ Ursæ Majoris . .	3.3	11 3 21.884	+ 3.3939	+ 45 6 20.61	— 19.503
δ Leonis . . .	2.3	11 8 9.104	3.1985	+ 21 8 13.78	19.685
* ν Ursæ Majoris . .	3.3	11 12 25.838	3.2580	+ 33 42 19.23	19.572
δ Crateris . . .	3.3	11 13 44.501	2.9963	— 14 10 21.67	19.463
o Cephei . . S. P.	5.3	11 14 1.779	2.4434	+112 30 4.11	19.669
τ Leonis . . .	5.0	11 22 10.642	+ 3.0861	+ 3 28 22.58	— 19.802
λ Draconis . . .	3.3	11 24 44.754	3.6230	+ 69 56 56.82	19.837
* ξ Hydræ . . .	4.0	11 27 29.597	2.9427	— 31 14 17.17	19.883
υ Leonis . . .	5.0	11 31 12.860	3.0713	— 0 12 19.87	19.860
γ Cephei . . S. P.	3.3	11 34 45.135	2.4143	+102 59 34.18	20.075
* χ Ursæ Majoris . .	3.7	11 40 8.096	+ 3.1910	+ 48 24 1.18	— 19.960
β Leonis . . .	2.0	11 43 20.803	3 0641	+ 15 11 53.09	20.119
γ Ursæ Majoris . .	2.3	11 47 56 300	3.1824	+ 54 19 2.51	20.027
Groombr. 4163 . S. P.	7.0	11 49 23.481	2.8638	+106 12 46.68	20.023
* π Virginis . . .	4.3	11 55 8.001	3.0752	+ 7 14 19.80	20.088
o Virginis . . .	4.0	11 59 30.224	+ 3.0576	+ 9 21 18.16	— 20.015
* ϵ Corvi . . .	3.0	12 4 21.868	3.0828	— 21 59 48.46	20.050
4 Draconis (H.) . .	4 7	12 6 57.018	2.8877	+ 78 14 19.02	20.023
γ Corvi . . .	2.0	12 10 2.808	3.0794	— 16 55 12.16	20.018
* 2 Canum Venaticorum	5.3	12 10 30.780	3.0223	+ 41 17 1.58	20.067
β Chamæleontis . .	5.0	12 11 47.483	+ 3.3996	— 78 41 24.31	— 19.984
η Virginis . . .	3.3	12 14 10.563	3.0686	— 0 2 39.83	20.042
* 6 Ursæ Minoris . .	6.0	12 14 20.008	0.1410	+ 88 19 15.31	19.941
α^1 Crucis . . .	1.0	12 20 22.432	3.2915	— 62 28 41.66	20.016
* δ^2 Corvi	2.3	12 24 4.285	3.1023	— 15 53 29.84	20.088
* β Canum Venaticorum	4.3	12 28 25.397	+ 2.8598	+ 41 57 57.92	— 19.616
β Corvi . . .	2.3	12 28 30.264	3.1414	— 22 46 38.34	19.964
κ Draconis . . .	3.3	12 28 42.041	2.5926	+ 70 24 20.22	19.891
* γ Virginis (*mean*) .	2.7	12 35 59.135	3.0381	— 0 50 6.79	19.813
21 Cassiopeæ . S. P.	6.0	12 38 15.507	3.8552	+105 37 27.44	19.754
* 31 Comæ Berenices .	5.0	12 46 14.665	+ 2.9303	+ 28 9 0.60	— 19.663
32^2 Camelopardalis (H.).	4.7	12 48 18.675	0.3897	+ 84 1 17.95	19.597
* γ Cassiopeæ . S. P.	2.0	12 49 57.123	3.5779	+119 53 24.17	19.565
α Canum Venaticorum	2.7	12 50 47.330	2.8157	+ 38 55 23.95	19.514
* 43 Cephei (H.) . S. P.	4.3	12 53 33.741	7.2152	+ 94 20 38 99	19.507
* δ Muscæ . . .	4.0	12 54 34.873	+ 4.1122	— 70 56 39.17	— 19.478
* ϵ Virginis . . .	2.7	12 56 36.127	2.9880	+ 11 33 40.46	19.419
θ Virginis . . .	4.3	13 4 9.047	3.1010	— 4 56 27.29	19.314
* 20 Canum Venaticorum	4.7	13 12 31.205	2.6970	+ 41 9 44.57	19.038
α Urs. Min. (*Polaris*) S. P.	2.0	13 17 44.827	+22.9790	+ 91 17 19.40	— 18.910

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MEAN PLACES FOR 1888.0. (January 0d.196, Washington.)

	Name of Star.		Magnitude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
				h m s	s	° ′ ″	″
	α Virginis (*Spica*) .		1.0	13 19 17.558	+ 3.1535	− 10 34 35.56	− 18.903
	38 Cassiopeæ .	S. P.	6.3	13 22 54.174	4.3757	+110 18 44.08	18.680
*	κ Octantis . .	.	5.0	13 22 58.154	8.7229	− 85 12 40.12	18.755
	ζ Virginis . .	.	3.3	13 28 59-169	3.0530	− 0 1 22.88	18.521
*	B. A. C. 4536 . .	.	5.0	13 29 47.703	2.6824	+ 37 45 22.89	18.542
*	m Virginis . .	.	6.0	13 35 44.031	+ 3.1429	− 8 8 15.13	− 18.293
	η Ursæ Majoris .	.	2.0	13 43 7.668	2.3714	+ 49 52 20.61	18.082
	η Bootis . .	.	3.0	13 49 21.124	2.8567	+ 18 57 33.99	18.174
	50 Cassiopeæ .	S. P.	4.0	13 53 52.821	5.0085	+108 7 16.39	17.651
*	θ Apodis . .	.	5.0	13 54 26.490	5.6704	− 76 15 18.31	17.600
	β Centauri . .	.	1.0	13 55 55.297	+ 4.1765	− 59 49 56.13	− 17.595
*	π Hydræ . .	.	3.7	13 59 59.607	3.4005	− 26 8 30.65	17.368
	α Draconis . .	.	3.3	14 1 21.483	1.6237	+ 64 54 40.31	17.301
*	d Bootis . .	.	5.0	14 5 17.495	2.7388	+ 25 37 20.90	17.204
*	κ Virginis . .	.	4.3	14 6 55.300	3.1938	− 9 45 7.57	16 933
*	δ Octantis . .	.	5.0	14 9 3.399	+ 8.9628	− 83 9 12.14	− 16.965
*	4 Ursæ Minoris .	.	5.0	14 9 17.670	− 0.3249	+ 78 4 25.86	16.909
	α Bootis (*Arcturus*) .		1.0	14 10 33.184	+ 2.7349	+ 19 45 56.87	18.887
*	λ Bootis . .	.	4.0	14 12 7.543	2.2830	+ 46 36 10.14	16.663
*	λ Virginis . .	.	4.7	14 13 2.992	3.2378	− 12 51 18.66	16.734
	ι Cassiopeæ .	S. P.	4.0	14 19 50.427	+ 4.8603	+113 6 6.67	− 16.439
	θ Bootis . .	.	4.0	14 21 23.096	2.0442	+ 52 22 7.03	16.765
	ρ Bootis . .	.	3.7	14 27 0.249	+ 2.5877	+ 30 51 47.90	15.965
	5 Ursæ Minoris .	.	4.7	14 27 46.180	− 0.1919	+ 76 11 37.87	16.011
	α^2 Centauri . .	.	1.0	14 32 0.953	+ 4.0450	− 60 22 31.86	15.381
*	α Apodis . .	.	4.7	14 33 59.295	+ 7.1877	− 78 34 5.91	− 15.695
*	μ Hydri . .	S. P.	6.0	14 34 3.414	− 1.4579	−100 24 8.40	15.680
*	33 Bootis . .	.	5.3	14 34 40.139	+ 2.2344	+ 44 53 16.85	15.715
	ε Bootis . .	.	2.3	14 40 5.800	2.6213	+ 27 32 48.13	15.346
	α^2 Libræ . .	.	2.3	14 44 40.944	3.3093	− 15 34 33.19	15.174
*	47 Cephei (H.) .	S. P.	6.0	14 51 13.390	+ 7.7152	+101 1 31.21	− 14.708
	β Ursæ Minoris .	.	2.0	14 51 2.289	− 0.2325	+ 74 36 47.49	14.719
*	γ Scorpii . .	.	3.3	14 57 30.987	+ 3.5018	− 24 50 27 98	14.362
	β Bootis . .	.	3.0	14 57 43.657	2.2601	+ 40 49 57.32	14.365
	48 Cephei (H.) .	S. P.	6.3	15 6 7.888	7.4018	+102 40 41.49	13.743
	β Libræ . .	.	2.0	15 10 58.810	+ 3.2216	− 8 58 8.99	− 13.515
*	δ Bootis . .	.	3.0	15 10 59.284	2.4208	+ 33 43 59.39	13.589
*	ρ Octantis . .	.	6.0	15 17 34.930	12.9580	− 84 5 21.10	13.003
	μ^1 Bootis . .	.	4.0	15 20 15.585	+ 2.2662	+ 37 46 13.31	12.784
	γ^2 Ursæ Minoris .	.	3.0	15 20 54.679	− 0.1347	+ 72 13 57.08	12.811
*	β Coronæ Borealis .		4.0	15 23 12.707	+ 2.4750	+ 29 29 31.31	− 12.600
	α Coronæ Borealis .		2.0	15 29 56.777	2.5393	+ 27 5 31.26	12.311
*	γ Camelop. (H.) .	S. P.	4.3	15 38 32.646	6.2351	+109 0 51.08	11.556
	α Serpentis . .	.	2.3	15 38 45.083	2.9515	+ 6 46 42.33	11.558
	ε Serpentis . .	.	3.3	15 45 13.995	+ 2.9870	+ 4 48 55.59	11.056
	ζ Ursæ Minoris . .	.	4.3	15 48 4.446	− 2.2543	+ 78 8 19.07	− 10.917
	ε Coronæ Borealis .		4.0	15 52 57.109	+ 2.4832	+ 27 12 9.46	10.617
	δ Scorpii . .	.	2.3	15 53 42.686	3.5385	− 22 18 7.97	10.536
	β^1 Scorpii . .	.	2.0	15 58 55.510	3.4806	− 19 29 53.63	10.146
*	δ^1 Apodis . .	.	5.3	16 3 38.187	+ 8.7695	− 78 24 41.16	− 9.750

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MEAN PLACES FOR 1888.0. (January 0d.196, Washington.)

	Name of Star.	Magnitude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
			h m s	s	° ′ ″	″
*	φ Herculis	4.0	16 5 14.271	+ 1.8811	+ 45 13 43.92	— 9.585
	Groombridge 2320	6.3	16 6 0.904	0.1392	+ 68 6 19.13	9.499
	δ Ophiuchi	3.0	16 8 28.584	3.1395	— 3 24 19.10	9.521
*	σ Coronæ Borealis (*mean*)	5.7	16 10 29.003	2.2445	+ 34 8 34.67	9.263
*	γ Apodis	4.3	16 16 18.090	9.0593	— 78 38 37.66	8.767
	τ Herculis	3.3	16 16 22.486	+ 1.8010	+ 46 34 48.99	— 8.739
*	η Ursæ Minoris	5.0	16 20 47.104	— 1.8180	+ 76 0 47.29	8.159
	η Draconis	2.7	16 22 28.642	+ 0.8061	+ 61 46 4.12	8.224
	α Scorpii (*Antares*)	1.3	16 22 32.426	3.6700	— 26 10 57.62	8.310
	β Herculis	2.3	16 25 24.321	+ 2.5774	+ 21 44 3.11	8.063
	A Draconis	5.0	16 28 12.446	— 0.1355	+ 69 0 36.93	— 7.798
	ζ Ophiuchi	2.7	16 30 59.505	+ 3.2990	— 10 20 22.38	7.572
	α Trianguli Australis	2.0	16 36 48.770	6.3024	— 68 49 13.34	7.170
	η Herculis	3.3	16 39 3.357	2.0537	+ 39 8 8.32	7.027
	α Camelopardalis S. P.	4.7	16 42 54.966	5.9240	+113 50 56.56	6.617
	κ Ophiuchi	3.3	16 52 22.030	+ 2.8374	+ 9 32 59.22	— 5.838
	d Herculis	5.0	16 57 28.262	+ 2.2112	+ 33 43 51.27	5.402
	ϵ Ursæ Minoris	4.3	16 57 28.276	— 6.3360	+ 82 13 12.96	5.406
*	η Ophiuchi	2.7	17 3 57.272	+ 3.4369	— 15 35 7.65	4.745
	α^1 Herculis (*var.*)	3.5	17 9 32.438	2.7334	+ 14 31 6.84	4.353
*	π Herculis	3.0	17 11 8.794	+ 2.0889	+ 36 56 8.74	— 4.234
*	θ Ophiuchi	3.3	17 15 7.862	3.6789	— 24 53 13.01	3.953
	b Ophiuchi (*var.*)	5.0	17 19 31 823	3.6589	— 24 4 16.99	3.654
*	δ Aræ	4.0	17 20 59.499	5.4011	— 60 35 21.35	3.539
	Groombr. 966 S. P.	6.3	17 24 45.555	7.9996	+105 1 56.44	3.091
*	Groombr. 944 S. P.	6.3	17 26 11.048	+18.6430	+ 94 51 43.33	— 2.960
	β Draconis	2.7	17 27 54.164	1.3533	+ 52 23 4.01	2.800
	α Ophiuchi	2.0	17 29 44.133	2.7829	+ 12 38 31.69	2.877
*	ι Herculis	3.3	17 36 18.306	+ 1.6964	+ 46 3 58.32	2.071
	ω Draconis	5.0	17 37 36.510	— 0.3540	+ 68 48 34.56	1.632
	μ Herculis	3.3	17 42 4.546	+ 2.3463	+ 27 47 11.64	— 2.327
	ψ^1 Draconis	4.3	17 43 55.836	— 1.0794	+ 72 12 12.56	1.678
*	θ Herculis	4.0	17 52 24.699	+ 2.0550	+ 37 15 56.73	0.644
	γ Draconis	2.3	17 54 0.331	1.3915	+ 51 30 8.07	0.554
	γ^2 Sagittarii	3.3	17 58 36.784	3.8515	— 30 25 28.43	— 0.340
*	o Herculis	4.0	18 3 10.427	+ 2.3393	+ 28 44 51.02	+ 0.267
	22 Camelop. (H.) S. P.	4.7	18 6 29.968	6.6175	+110 38 33 03	0.687
	μ^1 Sagittarii	4.0	18 7 3.924	+ 3.5866	— 21 5 14.16	0.606
	δ Ursæ Minoris	4.3	18 8 26.569	—19.4620	+ 86 36 40.24	0.790
	η Serpentis	3.0	18 15 30.871	+ 3.1023	— 2 55 37.02	0.682
*	λ Sagittarii	3.0	18 21 3.514	+ 3.7027	— 25 28 58.05	+ 1.629
*	χ Draconis	4.0	18 23 4.495	— 1.0794	+ 72 41 2.19	1.640
	1 Aquilæ	4.3	18 29 6.743	+ 3.2645	— 8 19 18.27	2.210
*	ζ Pavonis	4.0	18 29 56.621	7.0300	— 71 31 18.35	2.471
	α Lyræ (*Vega*)	1.0	18 33 8.803	2.0313	+ 38 40 47.03	3.163
	σ Octantis	6.0	18 38 50.637	+106.5070	— 89 16 8.18	+ 3.364
	β Lyræ (*var.*)	4.0	18 45 56.709	2.2142	+ 33 13 58.63	3.976
	51 Cephei (H.) S. P.	5.3	18 47 45.601	29.9400	+ 92 46 47.16	4.241
	σ Sagittarii	2.3	18 48 19.226	+ 3.7217	— 26 26 5.92	4.119
	50 Draconis	6.0	18 49 58.873	— 1.9072	+ 75 18 5.27	+ 4.414

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				h m s	s	° ′ ″	″
*	γ Lyræ		3.3	18 54 45.257	+ 2.2443	+ 32 32 10.94	+ 4.756
	ζ Aquilæ		3.0	19 0 15.751	2.7569	+ 13 41 51.10	5.109
*	ι Lyræ		5.0	19 3 18.343	2.1411	+ 35 55 30.00	5.478
*	25 Camelopardalis	S. P.	4.7	19 7 28.728	12.9660	+ 97 22 31.82	5.850
	d Sagittarii		5.0	19 11 4.901	3.5123	− 19 9 5.17	6.102
*	θ Lyræ		4.3	19 12 28.791	+ 2.0789	+ 37 56 4.24	+ 6.238
	δ Draconis		3.0	19 12 31.680	+ 0.0299	+ 67 27 52.29	6.326
	τ Draconis		4.7	19 17 42.254	− 1.1162	+ 73 8 50.30	6.778
	Piazzi vii. 67	S. P.	6.0	19 19 13.391	+ 6.2999	+111 18 24.99	6.832
	δ Aquilæ		3.3	19 19 51.078	3.0253	+ 2 53 31.44	6.923
*	β Cygni		3.0	19 26 12.284	+ 2.4193	+ 27 43 29.46	+ 7.358
	κ Aquilæ		5.0	19 30 51.946	3.2289	− 7 16 32.76	7.744
*	β Sagittæ		4.3	19 36 1.125	+ 2.6955	+ 17 13 0.83	8.130
	λ Ursæ Minoris		6.3	19 35 44.175	−64.4780	+ 88 57 44.44	8.145
	γ Aquilæ		3.0	19 40 56.105	+ 2.8522	+ 10 20 27.01	8.541
*	δ Cygni		2.7	19 41 28.497	+ 1.8761	+ 44 51 27.46	+ 8.628
	α Aquilæ (*Altair*)		1.3	19 45 19.132	2.9276	+ 8 34 22.87	9.265
*	Groombr. 1374	S. P.	5.7	19 46 46.422	7.2885	+105 47 4.13	9.042
*	ε Pavonis		4.0	19 47 37.240	+ 7.0221	− 73 12 14.38	9.074
	ε Draconis		3.7	19 48 32.813	− 0.1786	+ 69 58 57.66	9.174
	β Aquilæ		4.0	19 49 48.707	+ 2.9471	+ 6 7 38.98	+ 8.754
*	γ Sagittæ		3.7	19 53 46.587	2.6678	+ 19 11 18.50	9.589
*	c Sagittarii		5.0	19 55 46.174	3.6952	− 28 1 13.66	9.725
	τ Aquilæ		6.0	19 58 40.164	2.9331	+ 6 57 44.39	9.933
	3 Ursæ Majoris (H.)	S. P.	5.7	20 1 39.733	6.0507	+111 11 51.11	10.150
*	θ Aquilæ		3.0	20 5 31.526	+ 3.0974	− 1 9 11.61	+ 10.451
*	31 Cygni		4.3	20 10 6.306	1.8893	+ 46 24 6.76	10.786
	α^2 Capricorni		3.0	20 11 50.417	+ 3.3323	− 12 53 28.94	10.910
	κ Cephei (*pr.*)		4.3	20 12 38.803	− 1.9208	+ 77 22 25.60	10.998
	α Pavonis		2.0	20 16 47.411	+ 4.7849	− 57 5 34.27	11.180
	γ Cygni		2.3	20 18 12.630	+ 2.1537	+ 39 53 54.43	+ 11.320
	π Capricorni		5.0	20 20 54.633	3.4398	− 18 34 41.85	11.550
	ε Delphini		4.0	20 27 51.757	+ 2.8672	+ 10 55 23.36	12.037
	Groombridge 3241		6.3	20 30 29.100	− 0.2189	+ 72 9 7.90	12.221
*	α Delphini		3.0	20 34 26.150	+ 2.7878	+ 15 31 2.31	12.514
*	β Pavonis		3.7	20 34 51.503	+ 5.4757	− 66 36 15.74	+ 12.520
	α Cygni		1.7	20 37 36.850	2.0444	+ 44 52 49.15	12.721
*	ψ Capricorni		4.3	20 39 27.720	3.5588	− 25 40 22.12	12.683
*	ε Cygni		2.7	20 41 40.783	2.4274	+ 33 33 3.38	13.335
	μ Aquarii		4.7	20 46 36.775	+ 3.2399	− 9 24 11.24	13.284
	12 Year Cat. 1879		6.0	20 52 38.746	− 2.5446	+ 80 7 54.48	+ 13.687
	ν Cygni		4.0	20 52 59.866	+ 2.2341	+ 40 44 10.38	13.721
	σ^2 Ursæ Majoris	S. P.	5.0	21 0 31 802	5.3567	+112 24 41.69	14.268
	61^1 Cygni		5.0	21 1 52.596	2.6832	+ 38 11 56.07	17.527
	ζ Cygni		3.0	21 8 10.146	2.5496	+ 29 46 3.92	14.606
*	τ Cygni		4.0	21 10 19.243	+ 2.3932	+ 37 34 3.22	+ 15.259
	α Cephei		2.7	21 15 54.383	1.4366	+ 62 6 40.11	15.171
	1 Pegasi		4.3	21 16 54.388	2.7722	+ 19 19 32.22	15.237
*	ζ Capricorni		4.3	21 20 16.269	3.4329	− 22 53 45.38	15.396
	1 Draconis (H.)	S. P.	4.0	21 21 3 761	+ 9 0105	+ 98 10 47.17	+ 15.439

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	Name of Star.		Magnitude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
				h m s	s	° ′ ″	″
	d Ursæ Majoris	S. P.	4.7	21 24 33.920	+ 5.4032	+109 40 41.56	+ 15.555
	β Aquarii		3.0	21 25 39.776	3.1618	— 6 3 48.75	15.659
	β Cephei (*pr.*)		3.0	21 27 12.716	0.7946	+ 70 4 8.57	15.755
	ξ Aquarii		5.0	21 31 47.396	3.1980	— 8 21 22.03	15.968
*	74 Cygni		5.0	21 32 27.608	2.4014	+ 39 54 37.54	16.049
*	λ^1 Octantis		5.3	21 33 38.684	+ 9.8038	— 83 13 58.20	+ 16.022
*	ζ Chamælontis	S. P.	5.0	21 37 9.497	— 1.5582	— 99 33 43.60	16.289
	ε Pegasi		2.3	21 38 41.132	+ 2.9467	+ 9 21 42.55	16.354
	11 Cephei		5.0	21 40 16.830	0.9018	+ 70 47 44.97	16.538
*	π^2 Cygni		4.3	21 42 39.354	2.2129	+ 48 47 29.66	16.541
	μ Capricorni		5.0	21 47 11.376	+ 3.2762	— 14 4 43.14	+ 16.777
*	16 Pegasi		5.3	21 47 57.965	2.7278	+ 25 23 54.28	16.816
	79 Draconis		6.3	21 51 28.178	0.7298	+ 73 10 21.03	17.013
	a Aquarii		3.0	22 0 1.882	3.0828	— 0 51 49.26	17.354
	a Gruis		2.0	22 1 10.278	3.8067	— 47 30 10.20	17.245
*	π Pegasi		4.0	22 5 0.816	+ 2.6599	+ 32 37 44.19	+ 17.578
*	υ Octantis		6.0	22 9 58.548	13.2276	— 86 32 7.91	17.873
	32 Ursæ Majoris	S. P.	6.0	22 9 53.604	4.4224	+114 20 0.66	17.809
	θ Aquarii		4.3	22 10 55.412	3.1693	— 8 20 26.57	17.800
*	γ Aquarii		3.3	22 15 52.259	3.1010	— 1 57 5.42	18.038
	π Aquarii		4.7	22 19 33.448	+ 3.0647	+ 0 48 33.47	+ 18.153
*	σ Aquarii		5.0	22 24 43.101	3.1759	— 11 15 2.94	18.316
	9 Draconis	S. P.	4.7	22 25 33.737	5.2668	+103 42 38.10	18.390
*	a Lacertæ		4.0	22 26 40.649	2.4620	+ 49 42 24.35	18.413
	η Aquarii		4.0	22 29 36.064	3.0837	— 0 41 40.42	18.456
	226 Cephei (B.)		5.3	22 30 18.381	+ 1.0779	+ 75 38 57.31	+ 18.528
*	10 Lacertæ		5.0	22 34 14.162	2.6863	+ 38 28 2.91	18.668
*	β Octantis		4.7	22 34 33.510	6.4940	— 81 58 4.69	18.677
	ζ Pegasi		3.3	22 35 52.585	2.9909	+ 10 14 48.80	18.704
*	λ Pegasi		4.0	22 41 8.188	2.8849	+ 22 58 35.09	18.872
	ι Cephei		3.3	22 45 41.558	+ 2.1215	+ 65 36 40.90	+ 18.876
	λ Aquarii		4.0	22 46 46.305	3.1329	— 8 10 31.25	19.073
*	Groombr. 1706	S. P.	6.0	22 50 58 401	4.9744	+101 37 48.17	19.178
	a Pis. Aus. (*Fomalhaut*)		1.3	22 51 27.632	3.3252	— 30 12 56.30	18.992
*	o Andromedæ		3.7	22 56 46.097	2.7496	+ 41 43 26.43	19.286
	a Ursæ Majoris	S. P.	2.0	22 56 48.644	+ 3.7486	+117 38 40.28	+ 19.362
	a Pegasi (*Markab*)		2.0	22 59 10.925	2.9849	+ 14 36 9.82	19.301
*	φ Aquarii		4.3	23 8 31.341	3.1090	— 6 39 9.36	19.358
	o Cephei		5.3	23 14 1.779	2.4434	+ 67 29 55.89	19.669
*	τ Pegasi		4.7	23 15 5.616	2.9634	+ 23 7 38.06	19.655
	θ Piscium		4.7	23 22 17.199	+ 3.0411	+ 5 45 49.40	+ 19.726
	λ Draconis	S. P.	3.3	23 24 44.754	3.6230	+110 3 3.18	19.837
*	λ Andromedæ		4.0	23 32 5.022	2.9216	+ 45 51 4.05	19.470
	ι Piscium		4.3	23 34 11.386	3.0341	+ 5 1 9.43	19.483
	γ Cephei		3.3	23 34 45.135	2.4143	+ 77 0 25.82	20.075
*	i^1 Aquarii		5.0	23 38 23.566	+ 3.1170	— 18 53 54.37	+ 19.957
*	δ Sculptoris		4.3	23 43 5.513	3.1327	— 28 44 57.63	19.855
*	γ^1 Octantis		5.3	23 45 29.982	3.6946	— 82 38 28.57	19.991
	Groombridge 4163		7.0	23 49 23.481	2.8638	+ 73 47 13.32	20.023
	ω Piscium		4.0	23 53 33.615	3.0783	+ 6 14 35.56	19.931
*	33 Piscium		5.0	23 59 36.169	+ 3.0709	— 6 20 2.62	+ 20.144

* Apparent right ascensions of stars marked with an asterisk are given after those of standard stars.

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (*Polaris.*) Right Ascension.	α Ursæ Minoris. (*Polaris.*) Declination *North.*	Mean Solar Date.	51 Cephei (Hev.) Right Ascension.	51 Cephei (Hev.) Declination *North.*	Mean Solar Date.	δ Ursæ Minoris. Right Ascension.	δ Ursæ Minoris. Declination *North.*	Mean Solar Date.	λ Ursæ Minoris. Right Ascension.	λ Ursæ Minoris. Declination *North.*
Jan.	h m 1 17	° ′ +88 42	Jan.	h m 6 48	° ′ +87 13	Jan.	h m 18 8	° ′ +86 36	Jan.	h m 19 34	° ′ +88 57
	s	″		s	″		s	″		s	″
0.3	68.49	53.7	0.5	4.24	6.5	1.0	8.89	43.8	1.0	56.96	53.4
1.3	67.44	53.8	1.5	4.37	6.8	2.0	8.89	43.4	2.0	56.44	53.0
2.3	66.37	53.9	2.5	4.46	7.1	3.0	8.92	43.0	3.0	56.00	52.6
3.3	65.31	54.0	3.5	4.52	7.5	4.0	8.97	42.7	4.0	55.64	52.3
4.3	64.28	54.1	4.5	4.56	7.8	5.0	9.02	42.3	5.0	55.32	52.0
5.3	63.29	54.2	5.5	4.59	8.1	6.0	9.08	42.0	6.0	55.03	51.6
6.3	62.36	54.2	6.5	4.61	8.5	7.0	9.13	41.7	7.0	54.76	51.3
7.3	61.48	54.3	7.5	4.64	8.8	8.0	9.18	41.4	8.0	54.48	51.0
8.3	60.63	54.3	8.5	4.69	9.1	9.0	9.22	41.1	9.0	54.16	50.8
9.3	59.77	54.4	9.5	4.76	9.4	9.9	9.25	40.7	10.0	53.81	50.5
10.2	58.90	54.5	10.5	4.83	9.8	10.9	9.28	40.4	11.0	53.43	50.2
11.2	58.00	54.5	11.5	4.90	10.1	11.9	9.31	40.1	12.0	53.05	49.9
12.2	57.04	54.6	12.5	4.96	10.4	12.9	9.36	39.7	13.0	52.68	49.5
13.2	56.02	54.7	13.5	5.01	10.8	13.9	9.44	39.4	14.0	52.37	49.2
14.2	54.95	54.7	14.5	5.03	11.1	14.9	9.53	39.0	15.0	52.13	48.8
15.2	53.85	54.8	15.5	5.01	11.4	15.9	9.63	38.6	16.0	51.98	48.4
16.2	52.74	54.8	16.5	4.96	11.7	16.9	9.77	38.2	17.0	51.92	48.0
17.2	51.65	54.8	17.5	4.88	12.1	17.9	9.93	37.9	18.0	51.94	47.7
18.2	50.60	54.7	18.5	4.78	12.4	18.9	10.09	37.6	19.0	52.01	47.3
19.2	49.60	54.7	19.5	4.66	12.7	19.9	10.26	37.3	20.0	52.10	47.0
20.2	48.65	54.6	20.4	4.54	13.0	20.9	10.42	37.0	21.0	52.19	46.7
21.2	47.73	54.6	21.4	4.43	13.4	21.9	10.57	36.7	22.0	52.26	46.4
22.2	46.86	54.5	22.4	4.34	13.7	22.9	10.71	36.4	23.0	52.30	46.1
23.2	46.00	54.5	23.4	4.27	14.0	23.9	10.84	36.1	24.0	52.28	45.8
24.2	45.12	54.5	24.4	4.21	14.3	24.9	10.97	35.8	25.0	52.25	45.5
25.2	44.20	54.5	25.4	4.15	14.6	25.9	11.11	35.5	26.0	52.22	45.2
26.2	43.23	54.4	26.4	4.07	14.9	26.9	11.26	35.2	27.0	52.21	44.8
27.2	42.21	54.4	27.4	3.98	15.3	27.9	11.42	34.9	28.0	52.25	44.5
28.2	41.16	54.4	28.4	3.87	15.6	28.9	11.61	34.5	29.0	52.36	44.1
29.2	40.09	54.3	29.4	3.73	15.9	29.9	11.82	34.2	30.0	52.54	43.7
30.2	39.02	54.2	30.4	3.55	16.2	30.9	12.04	33.9	31.0	52.81	43.4
31.2	37.98	54.1	31.4	3.35	16.5	31.9	12.27	33.6			

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (*Polaris.*)		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
Feb.	h m 1 17	° ′ +88 42	Feb.	h m 6 47	° ′ +87 13	Feb.	h m 18 8	° ′ +86 36	Feb.	h m 19 34	° ′ +88 57
	s	″		s	″		s	″		s	″
1.2	36.99	54.0	1.4	63.13	16.8	1.9	12.51	33.3	1.0	53.14	43.0
2.2	36.07	53.9	2.4	62.91	17.1	2.9	12.76	33.1	1.9	53.50	42.7
3.2	35.21	53.8	3.4	62.70	17.4	3.9	13.00	32.9	2.9	53.89	42.4
4.2	34.40	53.6	4.4	62.50	17.7	4.9	13.22	32.6	3.9	54.27	42.1
5.2	33.61	53.5	5.4	62.31	17.9	5.9	13.43	32.4	4.9	54.61	41.8
6.2	32.82	53.4	6.4	62.14	18.2	6.9	13.64	32.2	5.9	54.93	41.5
7.2	32.01	53.3	7.4	61.98	18.5	7.9	13.85	31.9	6.9	55.22	41.2
8.2	31.17	53.2	8.4	61.82	18.8	8.9	14.06	31.7	7.9	55.49	40.9
9.2	30.28	53.1	9.4	61.64	19.0	9.9	14.29	31.4	8.9	55.76	40.6
10.2	29.34	53.0	10.4	61.44	19.3	10.9	14.55	31.1	9.9	56.07	40.3
11.2	28.37	52.9	11.4	61.20	19.6	11.9	14.83	30.8	10.9	56.46	40.0
12.2	27.39	52.8	12.4	60.92	19.9	12.9	15.13	30.5	11.9	56.92	39.6
13.2	26.43	52.6	13.4	60.62	20.1	13.9	15.44	30.3	12.9	57.45	39.3
14.2	25.51	52.4	14.4	60.30	20.4	14.9	15.76	30.1	13.9	58.08	39.0
15.1	24.65	52.2	15.4	59.96	20.6	15.9	16.09	29.9	14.9	58.77	38.7
16.1	23.85	51.9	16.4	59.62	20.9	16.8	16.41	29.7	15.9	59.48	38.4
17.1	23.10	51.7	17.4	59.29	21.1	17.8	16.72	29.5	16.9	60.20	38.1
18.1	22.40	51.5	18.4	58.97	21.4	18.8	17.02	29.4	17.9	60.91	37.8
19.1	21.73	51.3	19.4	58.66	21.6	19.8	17.31	29.2	18.9	61.58	37.6
20.1	21.06	51.1	20.4	58.38	21.8	20.8	17.59	29.0	19.9	62.21	37.3
21.1	20.37	50.9	21.4	58.11	22.0	21.8	17.87	28.8	20.9	62.81	37.1
22.1	19.65	50.8	22.4	57.84	22.3	22.8	18.16	28.6	21.9	63.37	36.8
23.1	18.89	50.6	23.4	57.55	22.5	23.8	18.46	28.4	22.9	63.95	36.6
24.1	18.09	50.4	24.3	57.24	22.7	24.8	18.77	28.2	23.9	64.56	36.3
25.1	17.27	50.2	25.3	56.91	22.9	25.8	19.09	28.0	24.9	65.23	36.0
26.1	16.45	50.0	26.3	56.55	23.1	26.8	19.44	27.8	25.9	65.96	35.7
27.1	15.66	49.7	27.3	56.16	23.3	27.8	19.80	27.6	26.9	66.78	35.4
28.1	14.93	49.5	28.3	55.76	23.5	28.8	20.17	27.5	27.9	67.65	35.2
29.1	14.27	49.2	29.3	55.36	23.7	29.8	20.53	27.4	28.9	68.57	34.9
									29.9	69.50	34.7

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*a* Ursæ Minoris. (*Polaris.*)		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	*δ* Ursæ Minoris.		Mean Solar Date.	*λ* Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
Mar.	h m 1 17	° ′ +88 42	Mar.	h m 6 47	° ′ +87 13	Mar.	h m 18 8	° ′ +86 36	Mar.	h m 19 35	° ′ +88 57
	s	″		s	″		s	″		s	″
1.1	13.68	48.9	1.3	54.97	23.8	1.8	20.89	27.3	1.9	10.44	34.5
2.1	13.16	48.6	2.3	54.59	24.0	2.8	21.23	27.2	2.9	11.35	34.3
3.1	12.68	48.4	3.3	54.22	24.2	3.8	21.56	27.1	3.9	12.22	34.1
4.1	12.21	48.1	4.3	53.87	24.3	4.8	21.88	27.0	4.9	13.04	33.9
5.1	11.73	47.9	5.3	53.54	24.5	5.8	22.19	26.9	5.9	13.83	33.7
6.1	11.24	47.7	6.3	53.21	24.7	6.8	22.50	26.8	6.9	14.61	33.5
7.1	10.72	47.5	7.3	52.88	24.8	7.8	22.82	26.7	7.9	15.41	33.3
8.1	10.16	47.2	8.3	52.53	24.9	8.8	23.16	26.6	8.9	16.25	33.1
9.1	9.56	47.0	9.3	52.16	25.1	9.8	23.52	26.4	9.8	17.15	32.9
10.1	8.94	46.7	10.3	51.76	25.2	10.8	23.90	26.3	10.8	18.14	32.7
11.1	8.33	46.4	11.3	51.33	25.4	11.8	24.29	26.2	11.8	19.19	32.4
12.1	7.76	46.1	12.3	50.87	25.5	12.8	24.69	26.2	12.8	20.32	32.2
13.1	7.25	45.8	13.3	50.40	25.7	13.8	25.09	26.1	13.8	21.48	32.1
14.1	6.82	45.5	14.3	49.93	25.8	14.8	25.48	26.1	14.8	22.64	31.9
15.1	6.46	45.2	15.3	49.46	25.8	15.8	25.86	26.1	15.8	23.78	31.8
16.1	6.15	44 8	16.3	49.01	25.9	16.8	26.23	26.1	16.8	24.88	31.6
17.1	5.89	44.5	17.3	48.58	25.9	17.8	26.58	26.1	17.8	25.93	31.5
18.1	5.64	44.2	18.3	48.18	26.0	18.8	26.93	26.1	18.8	26.93	31.4
19.1	5.38	44.0	19.3	47.80	26.0	19.8	27.26	26.1	19.8	27.89	31.3
20.1	5.10	43.7	20.3	47.43	26.1	20.8	27.59	26.1	20.8	28.84	31.2
21.1	4.79	43.4	21.3	47.05	26.2	21.8	27.92	26.0	21.8	29.81	31.0
22.0	4.44	43.2	22.3	46.66	26.3	22.7	28.27	26.0	22.8	30.81	30.9
23.0	4.07	42.9	23.3	46.24	26.4	23.7	28.64	25.9	23.8	31.87	30.8
24.0	3.70	42.6	24.3	45.80	26.5	24.7	29.02	25.9	24.8	32.99	30.6
25.0	3.36	42.3	25.3	45.35	26.5	25.7	29.41	25.9	25.8	34.16	30.5
26.0	3.06	41.9	26.3	44.88	26.6	26.7	29.80	25.9	26.8	35.38	30.4
27.0	2.82	41.6	27.3	44.40	26.6	27.7	30.18	26.0	27.8	36.62	30.3
28.0	2.66	41.3	28.3	43.94	26.6	28.7	30.56	26.1	28.8	37.84	30.2
29.0	2.58	40.9	29.3	43.49	26.6	29.7	30.93	26.1	29.8	39.02	30.2
30.0	2.55	40.6	30.3	43.06	26.6	30.7	31.28	26.2	30.8	40.16	30.1
31.0	2.56	40.3	31.3	42.66	26.5	31.7	31.61	26.3	31.8	41.26	30.1
32.0	2.57	40.0	32.2	42.27	26.5	32.7	31.93	26.4	32.8	42.31	30.1

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*a* Ursæ Minoris. (*Polaris.*) Right Ascension.	*a* Ursæ Minoris. (*Polaris.*) Declination *North.*	Mean Solar Date.	51 Cephei (Hev.) Right Ascension.	51 Cephei (Hev.) Declination *North.*	Mean Solar Date.	δ Ursæ Minoris. Right Ascension.	δ Ursæ Minoris. Declination *North.*	Mean Solar Date.	λ Ursæ Minoris. Right Ascension.	λ Ursæ Minoris. Declination *North.*
Apr.	h m 1 17	° +88 42′	Apr.	h m 6 47	° +87 13′	Apr.	h m 18 8	° +86 36′	Apr.	h m 19 35	° +88 57′
	s	″		s	″		s	″		s	″
1.0	2.57	40.0	1.2	42.27	26.5	1.7	31.93	26.4	1.8	42.31	30.1
2.0	2.56	39.7	2.2	41.90	26.5	2.7	32.24	26.5	2.8	43.32	30.1
3.0	2.52	39.4	3.2	41.53	26.5	3.7	32.56	26.5	3.8	44.32	30.0
4.0	2.45	39.2	4.2	41.16	26.4	4.7	32.89	26.6	4.8	45.34	29.9
5.0	2.35	38.9	5.2	40.77	26.4	5.7	33.23	26.6	5.8	46.42	29.9
6.0	2.23	38.6	6.2	40.35	26.5	6.7	33.58	26.7	6.8	47.56	29.8
7.0	2.12	38.3	7.2	39.91	26.5	7.7	33.95	26.7	7.8	48.75	29.8
8.0	2.03	37.9	8.2	39.45	26.4	8.7	34.32	26.8	8.8	50.00	29.7
9.0	1.99	37.6	9.2	38.98	26.4	9.7	34.70	26.9	9.8	51.29	29.7
10.0	2.02	37.2	10.2	38.50	26.3	10.7	35.07	27.1	10.8	52.59	29.7
11.0	2.12	36.9	11.2	38.02	26.3	11.7	35.43	27.2	11.8	53.86	29.7
12.0	2.29	36.6	12.2	37.57	26.2	12.7	35.77	27.4	12.8	55.09	29.8
13.0	2.50	36.2	13.2	37.15	26.1	13.7	36.09	27.6	13.8	56.26	29.8
14.0	2.74	35.9	14.2	36.75	25.9	14.7	36.39	27.7	14.8	57.37	29.9
15.0	2.99	35.6	15.2	36.38	25.8	15.7	36.67	27.9	15.7	58.41	29.9
16.0	3.22	35.4	16.2	36.03	25.7	16.7	36.95	28.0	16.7	59.42	30.0
17.0	3.41	35.1	17.2	35.68	25.7	17.7	37.23	28.2	17.7	60.42	30.0
18.0	3.56	34.8	18.2	35.33	25.6	18.7	37.52	28.3	18.7	61.44	30.0
19.0	3.69	34.5	19.2	34.96	25.5	19.7	37.82	28.4	19.7	62.50	30.0
20.0	3.82	34.3	20.2	34.58	25.4	20.7	38.13	28.6	20.7	63.61	30.0
21.0	3.96	34.0	21.2	34.19	25.4	21.7	38.45	28.7	21.7	64.77	30.1
22.0	4.13	33.7	22.2	33.78	25.3	22.7	38.77	28.9	22.7	65.97	30.1
23.0	4.36	33.3	23.2	33.35	25.1	23.7	39.08	29.1	23.7	67.17	30.2
24.0	4.66	33.0	24.2	32.93	25.0	24.7	39.39	29.3	24.7	68.36	30.3
25.0	5.03	32.7	25.2	32.53	24.8	25.7	39.68	29.5	25.7	69.53	30.4
26.0	5.46	32.4	26.2	32.16	24.6	26.7	39.94	29.7	26.7	70.64	30.5
27.0	5.93	32.1	27.2	31.82	24.5	27.7	40.19	30.0	27.7	71.69	30.7
27.9	6.42	31.8	28.2	31.50	24.3	28.6	40.43	30.2	28.7	72.68	30.8
28.9	6.91	31.6	29.2	31.20	24.1	29.6	40.66	30.4	29.7	73.62	30.9
29.9	7.37	31.4	30.2	30.91	23.9	30.6	40.88	30.6	30.7	74.52	31.1
30.9	7.78	31.1	31.2	30.62	23.8	31.6	41.11	30.8	31.7	75.42	31.2
31.9	8.15	30.9									

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (*Polaris.*)		Mean Solar Date.	51 Cephei (HEV.)		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
May	h m 1 17	° ′ +88 42	May	h m 6 47	° ′ +87 13	May	h m 18 8	° ′ +86 36	May	h m 19 36	° ′ +88 57
	s	″		s	″		s	″		s	″
1.9	8.15	30.9	1.2	30.62	23.8	1.6	41.11	30.8	1.7	15.42	31.2
2.9	8.50	30.7	2.2	30.33	23.6	2.6	41.34	31.0	2.7	16.35	31.3
3.9	8.84	30.4	3.2	30.03	23.5	3.6	41.58	31.2	3.7	17.32	31.4
4.9	9.20	30.1	4.2	29.70	23.3	4.6	41.84	31.4	4.6	18.35	31.5
5.9	9.60	29.9	5.2	29.35	23.2	5.6	42.11	31.6	5.6	19.43	31.6
6.9	10.05	29.6	6.2	28.98	23.0	6.6	42.38	31.8	6.6	20.55	31.7
7.9	10.57	29.3	7.1	28.61	22.8	7.6	42.64	32.1	7.6	21.68	31.9
8.9	11.16	29.0	8.1	28.25	22.6	8.6	42.89	32.4	8.6	22.79	32.0
9.9	11.80	28.7	9.1	27.91	22.4	9.6	43.12	32.7	9.6	23.84	32.2
10.9	12.47	28.5	10.1	27.60	22.1	10.6	43.33	33.0	10.6	24.83	32.4
11.9	13.15	28.3	11.1	27.32	21.9	11.6	43.51	33.3	11.6	25.75	32.6
12.9	13.82	28.1	12.1	27.06	21.6	12.6	43.67	33.5	12.6	26.60	32.8
13.9	14.46	27.9	13.1	26.83	21.4	13.6	43.82	33.8	13.6	27.39	33.0
14.9	15.05	27.7	14.1	26.62	21.2	14.6	43.97	34.1	14.6	28.14	33.2
15.9	15.61	27.5	15.1	26.41	21.0	15.6	44.12	34.3	15.6	28.89	33.4
16.9	16.14	27 3	16.1	26.19	20.8	16.6	44.28	34.5	16.6	29.67	33.6
17.9	16.68	27.1	17.1	25.96	20.6	17.6	44.45	34.8	17.6	30.50	33.7
18.9	17.25	26.9	18.1	25.71	20.4	18.6	44.63	35.0	18.6	31.36	33.9
19.9	17.86	26.7	19.1	25.45	20.2	19.6	44.81	35.3	19.6	32.25	34.1
20.9	18.52	26.5	20.1	25.18	19.9	20.6	44.99	35.5	20.6	33.15	34.3
21.9	19.24	26.2	21.1	24.92	19.7	21.6	45.16	35.8	21.6	34.05	34.5
22.9	20.03	26.0	22.1	24.67	19.4	22.6	45.31	36.2	22.6	34.92	34.7
23.9	20.86	25.9	23.1	24.44	19.1	23.6	45.44	36.5	23.6	35.73	35.0
24.9	21.72	25.7	24.1	24.24	18.8	24.6	45.55	36.8	24.6	36.46	35.3
25.9	22.58	25.5	25.1	24.09	18.5	25.6	45.64	37.2	25.6	37.12	35.5
26.9	23.41	25.4	26.1	23.96	18.2	26.6	45.71	37.5	26.6	37.73	35.8
27.9	24.20	25.3	27.1	23.84	18.0	27.6	45.78	37.8	27.6	38.29	36.1
28.9	24.94	25.2	28.1	23.72	17.7	28.6	45.84	38.0	28.6	38.82	36.3
29.9	25.64	25.1	29.1	23.61	17.4	29.6	45.91	38.3	29.6	39.36	36.5
30.9	26.33	25.0	30.1	23.49	17.2	30.6	45.99	38.6	30.6	39.94	36.7
31.9	27.00	24.8	31.1	23.34	17.0	31.6	46.08	38.8	31.6	40.56	37.0
32.9	27.70	24.6	32.1	23.17	16.7	32.6	46.18	39.1	32.6	41.23	37.2

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (*Polaris.*) Right Ascension.	α Ursæ Minoris. (*Polaris.*) Declination *North.*	Mean Solar Date.	51 Cephei (Hev.) Right Ascension.	51 Cephei (Hev.) Declination *North.*	Mean Solar Date.	δ Ursæ Minoris. Right Ascension.	δ Ursæ Minoris. Declination *North.*	Mean Solar Date.	λ Ursæ Minoris. Right Ascension.	λ Ursæ Minoris. Declination *North.*
June	h m 1 17	° ′ +88 42	June	h m 6 47	° ′ +87 13	June	h m 18 8	° ′ +86 36	June	h m 19 36	° ′ +88 57
	s	″		s	″		s	″		s	″
1.9	27.70	24.6	1.1	23.17	16.7	1.6	46.18	39.1	1.6	41.23	37.2
2.9	28.44	24.4	2.1	22.99	16.5	2.6	46.28	39.4	2.6	41.93	37.4
3.8	29.24	24.2	3.1	22.81	16.2	3.5	46.39	39.7	3.6	42.64	37.7
4.8	30.12	24.1	4.1	22.64	15.9	4.5	46.48	40.1	4.6	43.33	37.9
5.8	31.03	24.0	5.1	22.48	15.6	5.5	46.55	40.4	5.6	43.99	38.2
6.8	31.97	23.9	6.1	22.35	15.3	6.5	46.60	40.7	6.6	44.59	38.5
7.8	32.94	23.8	7.1	22.25	14.9	7.5	46.61	41.1	7.6	45.11	38.8
8.8	33.90	23.7	8.1	22.18	14.6	8.5	46.61	41.4	8.6	45.55	39.2
9.8	34.82	23.6	9.1	22.14	14.3	9.5	46.60	41.8	9.6	45.92	39.5
10.8	35.69	23.5	10.1	22.12	14.0	10.5	46.59	42.1	10.6	46.23	39.8
11.8	36.52	23.5	11.1	22.10	13.7	11.5	46.57	42.4	11.6	46.53	40.0
12.8	37.31	23.4	12.1	22.08	13.4	12.5	46.55	42.6	12.6	46.83	40.3
13.8	38.08	23.4	13.0	22.06	13.2	13.5	46.54	42.9	13.6	47.16	40.5
14.8	38.86	23.3	14.0	22.03	12.9	14.5	46.55	43.2	14.6	47.53	40.8
15.8	39.68	23.2	15.0	21.98	12.7	15.5	46.56	43.5	15.6	47.94	41.1
16.8	40.54	23.1	16.0	21.91	12.4	16.5	46.56	43.8	16.6	48.37	41.4
17.8	41.46	23.0	17.0	21.85	12.1	17.5	46.55	44.1	17.6	48.79	41.7
18.8	42.44	23.0	18.0	21.80	11.8	18.5	46.53	44.4	18.6	49.18	42.0
19.8	43.47	23.0	19.0	21.77	11.4	19.5	46.50	44.8	19.6	49.52	42.3
20.8	44.52	22.9	20.0	21.77	11.1	20.5	46.46	45.2	20.6	49.78	42.6
21.8	45.56	22.9	21.0	21.80	10.7	21.5	46.40	45.5	21.6	49.98	43.0
22.8	46.58	22.9	22.0	21.86	10.4	22.5	46.31	45.8	22.6	50.11	43.3
23.8	47.56	22.9	23.0	21.95	10.1	23.5	46.19	46.2	23.6	50.17	43.7
24.8	48.49	22.9	24.0	22.05	9.8	24.5	46.08	46.5	24.6	50.19	44.0
25.8	49.37	22.9	25.0	22.15	9.5	25.5	45.97	46.7	25.6	50.20	44.3
26.8	50.21	23.0	26.0	22.24	9.2	26.5	45.87	47.0	26.5	50.24	44.6
27.8	51.02	23.0	27.0	22.32	8.9	27.5	45.77	47.3	27.5	50.32	44.9
28.8	51.85	23.0	28.0	22.38	8.7	28.5	45.68	47.5	28.5	50.44	45.1
29.8	52.71	22.9	29.0	22.42	8.4	29.5	45.60	47.8	29.5	50.61	45.4
30.8	53.62	22.9	30.0	22.45	8.1	30.5	45.53	48.1	30.5	50.80	45.7
31.8	54.58	22.9	31.0	22.48	7.8	31.5	45.45	48.5	31.5	50.98	46.1

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (*Polaris.*)		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
July	h m s 1 17	° ′ ″ +88 42	July	h m s 6 47	° ′ ″ +87 12	July	h m s 18 8	° ′ ″ +86 36	July	h m s 19 36	° ′ ″ +88 57
	s	″		s	″		s	″		s	″
1.8	54.58	22.9	1.0	22.48	67.8	1.5	45.45	48.5	1.5	50.98	46.1
2.8	55.59	22.9	2.0	22.53	67.5	2.5	45.35	48.8	2.5	51.12	46.4
3.8	56.63	22.9	3.0	22.60	67.1	3.5	45.23	49.1	3.5	51.20	46.7
4.8	57.69	22.9	4.0	22.69	66.8	4.5	45.09	49.5	4.5	51.21	47.1
5.8	58.74	23.0	5.0	22.82	66.5	5.5	44.93	49.8	5.5	51.15	47.5
6.8	59.77	23.1	6.0	22.98	66.1	6.5	44.75	50.1	6.5	51.00	47.8
7.8	60.75	23.2	7.0	23.16	65.8	7.5	44.57	50.4	7.5	50.79	48.2
8.8	61.66	23.3	8.0	23.35	65.5	8.5	44.39	50.7	8.5	50.55	48.5
9.8	62.53	23.4	9.0	23.55	65.2	9.5	44.20	50.9	9.5	50.30	48.8
10.7	63.37	23.4	10.0	23.74	65.0	10.4	44.01	51.2	10.5	50.08	49.1
11.7	64.20	23.5	11.0	23.91	64.7	11.4	43.83	51.4	11.5	49.89	49.3
12.7	65.04	23.6	12.0	24.06	64.5	12.4	43.66	51.7	12.5	49.73	49.6
13.7	65.91	23.7	13.0	24.20	64.2	13.4	43.50	52.0	13.5	49.60	49.9
14.7	66.83	23.7	14.0	24.35	63.9	14.4	43.34	52.3	14.5	49.48	50.2
15.7	67.82	23.8	15.0	24.50	63.6	15.4	43.17	52.6	15.5	49.33	50.6
16.7	68.86	23.9	16.0	24.67	63.3	16.4	42.97	52.9	16.5	49.13	50.9
17.7	69.92	24.0	17.0	24.86	62.9	17.4	42.75	53.2	17.5	48.88	51.3
18.7	70.98	24.1	18.0	25.08	62.6	18.4	42.51	53.5	18.5	48.57	51.7
19.7	72.01	24.2	18.9	25.34	62.3	19.4	42.26	53.8	19.5	48.17	52.0
20.7	73.00	24.4	19.9	25.62	62.0	20.4	42.00	54.1	20.5	47.70	52.4
21.7	73.94	24.6	20.9	25.92	61.7	21.4	41.73	54.3	21.5	47.19	52.7
22.7	74.82	24.8	21.9	26.22	61.4	22.4	41.46	54.6	22.5	46.66	53.0
23.7	75.65	25.0	22.9	26.52	61.1	23.4	41.20	54.8	23.5	46.14	53.3
24.7	76.45	25.1	23.9	26.80	60.9	24.4	40.95	55.0	24.5	45.66	53.6
25.7	77.24	25.2	24.9	27.07	60.7	25.4	40.71	55.2	25.5	45.22	53.9
26.7	78.04	25.4	25.9	27.31	60.4	26.4	40.47	55.4	26.5	44.82	54.1
27.7	78.88	25.5	26.9	27.53	60.2	27.4	40.24	55.7	27.5	44.46	54.4
28.7	79.77	25.6	27.9	27.75	59.9	28.4	40.01	55.9	28.5	44.10	54.7
29.7	80.71	25.7	28.9	27.99	59.6	29.4	39.77	56.2	29.5	43.71	55.1
30.7	81.68	25.9	29.9	28.24	59.3	30.4	39.52	56.5	30.5	43.28	55.4
31.7	82.67	26.1	30.9	28.51	59.0	31.4	39.24	56.7	31.5	42.79	55.7
32.7	83.66	26.3	31.9	28.81	58.7	32.4	38.93	57.0	32.5	42.22	56.1

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (*Polaris.*) Right Ascension.	α Ursæ Minoris. (*Polaris.*) Declination *North.*	Mean Solar Date.	51 Cephei (Hev.) Right Ascension.	51 Cephei (Hev.) Declination *North.*	Mean Solar Date.	δ Ursæ Minoris. Right Ascension.	δ Ursæ Minoris. Declination *North.*	Mean Solar Date.	λ Ursæ Minoris. Right Ascension.	λ Ursæ Minoris. Declination *North.*
Aug.	h m 1 18	° ′ +88 42	Aug.	h m 6 47	° ′ +87 12	Aug.	h m 18 8	° ′ +86 36	Aug.	h m 19 36	° ′ +88 57
	s	″		s	″		s	″		s	″
1.7	23.66	26.3	1.9	29.15	58.4	1.4	38.93	57.0	1.5	42.22	56.1
2.7	24.62	26.5	2.9	29.51	58.2	2.4	38.61	57.3	2.4	41.57	56.4
3.7	25.52	26.7	3.9	29.88	57.9	3.4	38.28	57.5	3.4	40.85	56.7
4.7	26.37	27.0	4.9	30.26	57.7	4.4	37.95	57.7	4.4	40.08	57.0
5.7	27.16	27.2	5.9	30.64	57.5	5.4	37.62	57.9	5.4	39.31	57.3
6.7	27.89	27.4	6.9	31.00	57.3	6.4	37.30	58.1	6.4	38.55	57.6
7.7	28.60	27.6	7.9	31.34	57.1	7.4	36.99	58.2	7.4	37.83	57.9
8.7	29.32	27.8	8.9	31.67	56.8	8.4	36.68	58.4	8.4	37.14	58.1
9.7	30.07	28.0	9.9	31.99	56.6	9.4	36.38	58.6	9.4	36.48	58.4
10.7	30.86	28.2	10.9	32.31	56.4	10.4	36.08	58.8	10.4	35.85	58.7
11.7	31.69	28.4	11.9	32.64	56.1	11.4	35.77	59.0	11.4	35.20	59.0
12.7	32.56	28.6	12.9	32.99	55.9	12.4	35.46	59.2	12.4	34.52	59.3
13.7	33.46	28.9	13.9	33.38	55.6	13.4	35.13	59.4	13.4	33.79	59.6
14.7	34.37	29.1	14.9	33.79	55.3	14.4	34.77	59.7	14.4	33.00	59.9
15.6	35.26	29.4	15.9	34.22	55.1	15.4	34.40	59.9	15.4	32.13	60.2
16.6	36.12	29.7	16.9	34.67	54.8	16.3	34.02	60.1	16.4	31.19	60.5
17.6	36.92	30.0	17.9	35.12	54.6	17.3	33.63	60.2	17.4	30.20	60.8
18.6	37.65	30.3	18.9	35.58	54.4	18.3	33.23	60.4	18.4	29.19	61.1
19.6	38.32	30.6	19.9	36.03	54.3	19.3	32.84	60.5	19.4	28.18	61.3
20.6	38.95	30.9	20.9	36.46	54.1	20.3	32.47	60.6	20.4	27.19	61.6
21.6	39.55	31.1	21.9	36.86	53.9	21.3	32.11	60.8	21.4	26.25	61.8
22.6	40.15	31.4	22.9	37.24	53.8	22.3	31.76	60.9	22.4	25.36	62.1
23.6	40.78	31.7	23.9	37.61	53.6	23.3	31.42	61.0	23.4	24.51	62.3
24.6	41.45	31.9	24.9	37.98	53.4	24 3	31.09	61.1	24.4	23.69	62.5
25.6	42.17	32.1	25.8	38.36	53.2	25.3	30.75	61.3	25.4	22.87	62.8
26.6	42.92	32.4	26.8	38.77	53.0	26.3	30.39	61.5	26.4	22.00	63.0
27.6	43.69	32.7	27.8	39.20	52.8	27.3	30.02	61.7	27.4	21.07	63.3
28.6	44.45	33.0	28.8	39.66	52.6	28.3	29.62	61.8	28.4	20.07	63.6
29.6	45.20	33.3	29.8	40.15	52.4	29.3	29.21	62.0	29.4	19.00	63.9
30.6	45.90	33.6	30.8	40.66	52.2	30.3	28.79	62.1	30.4	17.87	64.1
31.6	46.54	33.9	31.8	41.17	52.0	31.3	28.36	62.2	31.4	16.68	64.4
32.6	47.11	34.3	32.8	41.67	51.9	32.3	27.94	62.3	32.4	15.47	64.6

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (*Polaris.*)		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
Sept.	h m 1 18	° ′ +88 42	Sept.	h m 6 47	° ′ +87 12	Sept.	h m 18 8	° ′ +86 37	Sept.	h m 19 35	° ′ +88 58
	s	″		s	″		s	″		s	″
1.6	47.11	34.3	1.8	41.67	51.9	1.3	27.94	2.3	1.4	75.47	4.6
2.6	47.63	34.6	2.8	42.16	51.8	2.3	27.52	2.4	2.4	74.28	4.8
3.6	48.11	34.9	3.8	42.64	51.7	3.3	27.11	2.4	3.4	73.13	5.0
4.6	48.58	35.3	4.8	43.10	51.6	4.3	26.72	2.5	4.4	72.01	5.2
5.6	49.05	35.6	5.8	43.54	51.4	5.3	26.34	2.5	5.4	70.93	5.4
6.6	49.56	35.9	6.8	43.98	51.3	6.3	25.96	2.6	6.4	69.89	5.6
7.6	50.11	36.2	7.8	44.42	51.2	7.3	25.57	2.7	7.4	68.85	5.8
8.6	50.71	36.5	8.8	44.87	51.0	8.3	25.18	2.8	8.3	67.79	6.0
9.6	51.34	36.8	9.8	45.35	50.8	9.3	24.78	2.9	9.3	66.69	6.2
10.6	51.98	37.1	10.8	45.86	50.7	10.3	24.37	3.0	10.3	65.53	6.5
11.6	52.61	37.5	11.8	46.40	50.5	11.3	23.93	3.1	11.3	64.31	6.7
12.6	53.20	37.8	12.8	46.95	50.4	12.3	23.48	3.2	12.3	63.04	6.9
13.6	53.74	38.2	13.8	47.51	50.3	13.3	23.02	3.2	13.3	61.70	7.1
14.6	54.22	38.6	14.8	48.07	50.2	14.3	22.56	3.3	14.3	60.32	7.3
15.6	54.63	39.0	15.8	48.62	50.1	15.3	22.11	3.3	15.3	58.95	7.5
16.6	54.98	39.4	16.8	49.15	50.0	16.3	21.67	3.3	16.3	57.60	7.6
17.6	55.28	39.7	17.8	49.65	50.0	17.3	21.24	3.3	17.3	56.30	7.8
18.6	55.59	40.1	18.8	50.13	49.9	18.3	20.83	3.3	18.3	55.06	7.9
19.6	55.91	40.4	19.8	50.60	49.9	19.3	20.44	3.3	19.3	53.87	8.0
20.6	56.25	40.7	20.8	51.06	49.8	20.3	20.06	3.3	20.3	52.71	8.1
21.5	56.63	41.0	21.8	51.51	49.7	21.3	19.67	3.3	21.3	51.56	8.3
22.5	57.05	41.4	22.8	51.98	49.6	22.2	19.27	3.3	22.3	50.40	8.4
23.5	57.50	41.7	23.8	52.48	49.5	23.2	18.86	3.4	23.3	49.20	8.6
24.5	57.95	42.1	24.8	53.00	49.4	24.2	18.43	3.4	24.3	47.93	8.8
25.5	58.39	42.4	25.8	53.55	49.3	25.2	17.98	3.4	25.3	46.60	9.0
26.5	58.79	42.8	26.8	54.12	49.2	26.2	17.52	3.4	26.3	45.20	9.1
27.5	59.12	43.2	27.8	54.70	49.2	27.2	17.06	3.4	27.3	43.75	9.3
28.5	59.38	43.6	28.8	55.28	49.2	28.2	16.61	3.4	28.3	42.27	9.4
29.5	59.58	44.0	29.8	55.84	49.2	29.2	16.16	3.3	29.3	40.81	9.5
30.5	59.73	44.4	30.8	56.38	49.2	30.2	15.72	3.3	30.3	39.38	9.6
31.5	59.85	44.8	31.7	56.90	49.2	31.2	15.29	3.2	31.3	37.99	9.6

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (*Polaris.*) Right Ascension.	α Ursæ Minoris. (*Polaris.*) Declination *North.*	Mean Solar Date.	51 Cephei (Hev.) Right Ascension.	51 Cephei (Hev.) Declination *North.*	Mean Solar Date.	δ Ursæ Minoris. Right Ascension.	δ Ursæ Minoris. Declination *North.*	Mean Solar Date.	λ Ursæ Minoris. Right Ascension.	λ Ursæ Minoris. Declination *North.*
Oct.	h m 1 18	° ′ +88 42	Oct.	h m 6 47	° ′ +87 12	Oct.	h m 18 8	° ′ +86 36	Oct.	h m 19 34	° ′ +88 58
	s	″		s	″		s	″		s	″
1.5	59.85	44.8	1.7	56.90	49.2	1.2	15.29	63.2	1.3	97.99	9.6
2.5	59.96	45.2	2.7	57.40	49.2	2.2	14.88	63.1	2.3	96.65	9.7
3.5	60.10	45.5	3.7	57.89	49.2	3.2	14.48	63.0	3.3	95.35	9.8
4.5	60.28	45.9	4.7	58.38	49.2	4.2	14.09	63.0	4.3	94.07	9.9
5.5	60.50	46.2	5.7	58.88	49.1	5.2	13.69	63.0	5.3	92.80	10.0
6.5	60.76	46.6	6.7	59.39	49.1	6.2	13.29	62.9	6.3	91.50	10.1
7.5	61.03	46.9	7.7	59.93	49.0	7.2	12.87	62.9	7.3	90.16	10.2
8.5	61.29	47.3	8.7	60.49	49.0	8.2	12.43	62.9	8.3	88.77	10.3
9.5	61.52	47.7	9.7	61.07	49.0	9.2	11.98	62.8	9.3	87.32	10.4
10.5	61.71	48.1	10.7	61.66	49.0	10.2	11.53	62.8	10.3	85.82	10.5
11.5	61.84	48.6	11.7	62.25	49.0	11.2	11.08	62.7	11.3	84.28	10.6
12.5	61.90	49.0	12.7	62.83	49.0	12.2	10.63	62.6	12.3	82.73	10.6
13.5	61.90	49.4	13.7	63.39	49.1	13.2	10.19	62.4	13.3	81.20	10.6
14.5	61.84	49.8	14.7	63.93	49.2	14.2	9.77	62.3	14.2	79.72	10.6
15.5	61.76	50.2	15.7	64.44	49.2	15.2	9.37	62.1	15.2	78.30	10.6
16.5	61.68	50.5	16.7	64.92	49.3	16.2	8.99	62.0	16.2	76.95	10.6
17.5	61.62	50.9	17.7	65.39	49.4	17.2	8.63	61.9	17.2	75.65	10.6
18.5	61.60	51.2	18.7	65.86	49.4	18.2	8.27	61.8	18.2	74.37	10.6
19.5	61.61	51.6	19.7	66.34	49.5	19.2	7.90	61.6	19.2	73.11	10.7
20.5	61.66	51.9	20.7	66.83	49.5	20.2	7.52	61.5	20.2	71.83	10.7
21.5	61.72	52.3	21.7	67.34	49.5	21.2	7.13	61.4	21.2	70.49	10.8
22.5	61.77	52.7	22.7	67.88	49.6	22.2	6.73	61.3	22.2	69.09	10.8
23.5	61.78	53.1	23.7	68.44	49.6	23.2	6.31	61.2	23.2	67.64	10.8
24.5	61.73	53.5	24.7	69.01	49.7	24 2	5.89	61.1	24.2	66.14	10.8
25.5	61.63	53.9	25.7	69.57	49.8	25.2	5.47	60.9	25.2	64.60	10.8
26.5	61.45	54.3	26.7	70.11	49.9	26.2	5.06	60.7	26.2	63.06	10.8
27.5	61.21	54.7	27.7	70.64	50.1	27.2	4.65	60.5	27.2	61.56	10.7
28.4	60.93	55.1	28.7	71.15	50.2	28.1	4.26	60.3	28.2	60.11	10.7
29.4	60.64	55.4	29.7	71.63	50.3	29.1	3.90	60.1	29.2	58.72	10.6
30.4	60.37	55.8	30.7	72.09	50.4	30.1	3.56	59.9	30.2	57.38	10.5
31.4	60.13	56.1	31.7	72.54	50.6	31.1	3.22	59.7	31.2	56.09	10.5
32.4	59.92	56.5	32.7	73.00	50.7	32.1	2.88	59.5	32.2	54.82	10.4

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (*Polaris.*) Right Ascension.	α Ursæ Minoris. (*Polaris.*) Declination *North.*	Mean Solar Date.	51 Cephei (Hev.) Right Ascension.	51 Cephei (Hev.) Declination *North.*	Mean Solar Date.	δ Ursæ Minoris. Right Ascension.	δ Ursæ Minoris. Declination *North.*	Mean Solar Date.	λ Ursæ Minoris. Right Ascension.	λ Ursæ Minoris. Declination *North.*
Nov.	h m 1 18	° ′ +88 42	Nov.	h m 6 48	° ′ +87 12	Nov.	h m 18 7	° ′ +86 36	Nov.	h m 19 34	° ′ +88 58
	s	″		s	″		s	″		s	″
1.4	59.92	56.5	1.7	13.00	50.7	1.1	62.88	59.5	1.2	54.82	10.4
2.4	59.75	56.8	2.7	13.47	50.8	2.1	62.54	59.4	2.2	53.55	10.4
3.4	59.61	57.2	3.7	13.95	50.9	3.1	62.19	59.2	3.2	52.24	10.3
4.4	59.47	57.5	4.7	14.46	51.0	4.1	61.83	59.0	4.2	50.88	10.3
5.4	59.31	57.9	5.7	14.99	51.1	5.1	61.45	58.9	5.2	49.47	10.3
6.4	59.10	58.3	6.6	15.53	51.2	6.1	61.07	58.7	6.2	48.02	10.2
7.4	58.84	58.7	7.6	16.07	51.4	7.1	60.69	58.5	7.2	46.54	10.2
8.4	58.51	59.1	8.6	16.60	51.5	8.1	60.32	58.2	8.2	45.05	10.1
9.4	58.11	59.5	9.6	17.11	51.7	9.1	59.96	58.0	9.2	43.57	10.0
10.4	57.65	59.8	10.6	17.59	51.9	10.1	59.62	57.7	10.2	42.15	9.8
11.4	57.15	60.2	11.6	18.03	52.1	11.1	59.30	57.4	11.2	40.80	9.7
12.4	56.65	60.5	12.6	18.45	52.3	12.1	59.00	57.2	12.2	39.52	9.5
13.4	56.16	60.8	13.6	18.85	52.5	13.1	58.71	56.9	13.2	38.30	9.4
14.4	55.70	61.1	14.6	19.24	52.7	14.1	58.43	56.6	14.2	37.13	9.3
15.4	55.28	61.4	15.6	19.63	52.9	15.1	58.16	56.4	15.2	35.99	9.1
16.4	54.90	61.7	16.6	20.03	53.0	16.1	57.89	56.2	16.2	34.84	9.0
17.4	54.54	62.0	17.6	20.45	53.2	17.1	57.61	56.0	17.2	33.66	8.9
18.4	54.17	62.3	18.6	20.89	53.4	18.1	57.32	55.8	18.2	32.44	8.8
19.4	53.78	62.7	19.6	21.34	53.5	19.1	57.02	55.5	19.2	31.17	8.7
20.4	53.35	63.0	20.6	21.80	53.7	20.1	56.71	55.3	20.1	29.86	8.6
21.4	52.86	63.4	21.6	22.26	54.0	21.1	56.40	55.0	21.1	28.52	8.4
22.4	52.29	63.7	22.6	22.72	54.2	22.1	56.10	54.7	22.1	27.18	8.3
23.4	51.66	64.1	23.6	23.15	54.4	23.1	55.82	54.4	23.1	25.87	8.1
24.4	50.99	64.4	24.6	23.55	54.7	24.1	55.56	54.1	24.1	24.61	7.9
25.4	50.29	64.7	25.6	23.92	55.0	25.1	55.31	53.7	25.1	23.41	7.7
26.4	49.60	65.0	26.6	24.27	55.2	26.1	55.08	53.4	26.1	22.28	7.4
27.4	48.93	65.3	27.6	24.61	55.5	27.1	54.87	53.1	27.1	21.21	7.2
28.4	48.30	65.5	28.6	24.93	55.7	28.1	54.66	52.8	28.1	20.19	7.0
29.4	47.72	65.8	29.6	25.26	55.9	29.1	54.46	52.5	29.1	19.17	6.8
30.4	47.17	66.0	30.6	25.60	56.1	30.1	54.25	52.3	30.1	18.14	6.7
31.4	46.63	66.3	31.6	25.96	56.4	31.1	54.03	52.0	31.1	17.09	6.5

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (*Polaris.*) Right Ascension.	α Ursæ Minoris. (*Polaris.*) Declination *North.*	Mean Solar Date.	51 Cephei (Hev.) Right Ascension.	51 Cephei (Hev.) Declination *North.*	Mean Solar Date.	δ Ursæ Minoris. Right Ascension.	δ Ursæ Minoris. Declination *North.*	Mean Solar Date.	λ Ursæ Minoris. Right Ascension.	λ Ursæ Minoris. Declination *North.*
Dec.	h m 1 18	° +88 43	Dec.	h m 6 48	° +87 12′	Dec.	h m 18 7	° +86 36′	Dec.	h m 19 33	° +88 57′
	s	″		s	″		s	″		s	″
1.4	46.63	6.3	1.6	25.96	56.4	1.1	54.03	52.0	1.1	77.09	66.5
2.4	46.09	6.6	2.6	26.34	56.6	2.1	53.80	51.7	2.1	76.00	66.3
3.3	45.51	6.9	3.6	26.73	58.8	3.1	53.56	51.4	3.1	74.87	66.2
4.3	44.88	7.2	4.6	27.11	57.1	4.0	53.32	51.1	4.1	73.70	66.0
5.3	44.19	7.5	5.6	27.49	57.3	5.0	53.09	50.8	5.1	72.53	65.7
6.3	43.44	7.8	6.6	27.86	57.6	6.0	52.87	50.5	6.1	71.37	65.5
7.3	42.62	8.1	7.6	28.20	57.9	7.0	52.67	50.1	7.1	70.26	65.2
8.3	41.76	8.3	8.6	28.51	58.3	8.0	52.50	49.7	8.1	69.22	65.0
9.3	40.89	8.6	9.6	28.78	58.6	9.0	52.35	49.4	9.1	68.26	64.7
10.3	40.03	8.8	10.6	29.02	58.9	10.0	52.22	49.0	10.1	67.38	64.4
11.3	39.19	9.0	11.6	29.24	59.2	11.0	52.10	48.7	11.1	66.57	64.1
12.3	38.39	9.2	12.5	29.46	59.5	12.0	51.99	48.4	12.1	65.81	63.9
13.3	37.63	9.3	13.5	29.68	59.7	13.0	51.89	48.1	13.1	65.06	63.6
14.3	36.91	9.5	14.5	29.91	60.0	14.0	51.78	47.8	14.1	64.29	63.4
15.3	36.20	9.7	15.5	30.16	60.3	15.0	51.67	47.5	15.1	63.49	63.2
16.3	35.48	9.9	16.5	30.42	60.5	16.0	51.54	47.2	16.1	62.67	62.9
17.3	34.73	10.2	17.5	30.69	60.8	17.0	51.40	46.8	17.1	61.80	62.7
18.3	33.92	10.4	18.5	30.97	61.2	18.0	51.26	46.5	18.1	60.89	62.4
19.3	33.06	10.6	19.5	31.24	61.4	19.0	51.13	46.1	19.1	59.99	62.2
20.3	32.13	10.8	20.5	31.49	61.8	20.0	51.02	45.8	20.1	59.12	61.9
21.3	31.14	11.0	21.5	31.70	62.1	21.0	50.92	45.4	21.1	58.30	61.6
22.3	30.13	11.2	22.5	31.88	62.4	22.0	50.84	45.0	22.1	57.55	61.2
23.3	29.13	11.4	23.5	32.04	62.8	23.0	50.77	44.6	23.1	56.88	60.9
24.3	28.14	11.5	24.5	32.17	63.2	24.0	50.72	44.3	24.1	56.28	60.6
25.3	27.19	11.6	25.5	32.28	63.5	25.0	50.70	43.9	25.1	55.73	60.3
26.3	26.30	11.7	26.5	32.40	63.8	26.0	50.69	43.6	26.0	55.21	60.0
27.3	25.46	11.9	27.5	32.53	64.1	27.0	50.67	43.3	27.0	54.70	59.7
28.3	24.64	12.0	28.5	32.68	64.3	28.0	50.64	42.9	28.0	54.17	59.4
29.3	23.83	12.1	29.5	32.84	64.6	29.0	50.60	42.6	29.0	53.61	59.1
30.3	23.00	12.2	30.5	33.00	64.9	30.0	50.56	42.3	30.0	53.03	58.9
31.3	22.14	12.4	31.5	33.17	65.2	31.0	50.51	42.0	31.0	52.42	58.6

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Andromedæ.		γ Pegasi. (*Algenib.*)		β Hydri.		12 Ceti.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*
	h m 0 2	° ′ +28 28	h m 0 7	° ′ +14 33	h m 0 19	° ′ −77 52	h m 0 24	° ′ − 4 34
	s	″	s	″	s	″	s	″
Jan. 0.2	35.16 −.15	22.5 −0.8	27.27 −.12	37.4 −0.8	47.93 −.92	92.2 +0.8	18.48 −.12	43.1 −0.7
10.2	35.02 .14	21 6 1.1	27.15 .12	36.6 0.9	47.03 .86	91.1 1.3	18.36 .12	43.8 0.6
20.2	34.88 .13	20.3 1.4	27.03 .11	35.6 1.0	46.21 .78	89.5 1.9	18.25 .11	44.3 0.5
30.2	34.75 .12	18.9 1.5	26.93 .10	34.5 1.1	45.46 .69	87.3 2.4	18.14 .10	44.7 0.4
Feb. 9.1	34.64 .10	17.3 1.6	26.84 .08	33.4 1.1	44.83 .58	84.7 2.8	18.05 .08	45.0 −0.2
19.1	34.56 −.07	15.6 −1.7	26.77 −.05	32.4 −1.0	44.31 −.45	81.7 +3.2	17.98 −.06	45.1 0.0
29.1	34.51 −.03	14.0 1.6	26.73 −.03	31.4 0.9	43.93 .31	78.3 3 5	17.93 .04	45.0 +0.2
Mar. 10.0	34.49 +.01	12.4 1.5	26.71 .00	30.6 0.7	43.69 −.16	74.7 3.7	17.90 −.01	44.8 0.4
20.0	34.52 .05	11.0 1.3	26.74 +.04	29.9 0.5	43.61 .00	71.0 3.8	17.91 +.03	44.2 0.6
30.0	34.59 .09	9.7 1.1	26.80 .09	29.5 −0.3	43.68 +.15	67.1 3.8	17.96 .07	43.5 0.9
Apr. 9.0	34.71 +.14	8.8 −0.8	26.91 +.13	29.4 0.0	43.92 +.31	63.3 +3.8	18.05 +.11	42.5 +1.1
18.9	34.87 .18	8.2 −0.4	27.06 .17	29.5 +0.3	44.31 .46	59.6 3.6	18.18 .15	41.3 1.3
28.9	35.08 .23	8.0 0.0	27.25 .21	30.0 0 6	44.84 .61	56.1 3.4	18.35 .19	39.8 1.6
May 8.9	35.33 .26	8.1 +0.3	27.47 .24	30.8 0.9	45.52 .75	52.8 3.1	18.55 .22	38.1 1.7
18.8	35.61 .29	8.7 0.7	27.73 .27	31.9 1.2	46.34 .86	49.9 2.8	18.80 .25	36.3 1.9
28.8	35.91 +.31	9.6 +1.1	28.02 +.29	33.3 +1.5	47.26 +.96	47.3 +2.3	19.06 +.28	34.4 +2.0
June 7.8	36.24 .33	10.9 1.5	28.32 .31	34.9 1.7	48.26 1.04	45.2 1.9	19.35 .30	32.3 2.0
17.8	36.58 .34	12.6 1.8	28.63 .31	36.7 1.9	49.34 1.10	43.6 1.4	19.66 .31	30.3 2.0
27.7	36.91 .33	14.4 2.0	28.95 .31	38.7 2.0	50.46 1.12	42.5 0.8	19.97 .31	28.2 2.0
July 7.7	37.24 .32	16.6 2.2	29.26 .30	40.8 2.1	51.59 1.12	41.9 +0.3	20.28 .30	26.3 1.9
17.7	37.55 +.30	18.9 +2.4	29.55 +.28	43.0 +2.1	52.70+1.08	41.9 −0.3	20.57 +.29	24.4 +1.7
27.7	37.84 .27	21.3 2.4	29.83 .26	45.1 2.1	53.76 1.02	42.6 0.9	20.85 .27	22.8 1.5
Aug. 6.6	38.09 .24	23.8 2.5	30.07 .23	47.2 2.0	54.74 .92	43.8 1.4	21.11 .24	21.4 1.3
16.6	38.31 .20	26.2 2.4	30.29 .20	49.2 1.9	55.60 .80	45.4 1.9	21.34 .21	20.2 1.1
26.6	38.49 .16	28.7 2.4	30.47 .16	51.0 1.7	56.33 .65	47.6 2.3	21.53 .18	19.3 0.8
Sept. 5.5	38.63 +.12	31.0 +2.3	30.61 +.12	52.6 +1.6	56.90 +.48	50.1 −2.7	21.69 +.14	18.6 +0.5
15.5	38.73 +.08	33.2 2.1	30.71 .08	54.1 1.4	57.30 .30	52.9 2 9	21.81 .10	18.2 +0.2
25.5	38.79 +.04	35.3 1.9	30.78 .05	55.4 1.1	57.51 +.11	55.9 3.1	21.89 .07	18.1 0.0
Oct. 5.5	38.81 .00	37.1 1.7	30.81 +.01	56.4 0.9	57.53 −.08	59.0 3.1	21.94 +.03	18.3 −0.2
15.4	38.80 −.03	38.7 1.5	30.80 −.02	57.2 0.6	57.35 .26	62.1 3.0	21.95 .00	18.6 0.4
25.4	38.75 −.06	40.0 +1.2	30.77 −.05	57.8 +0.5	57 00 −.43	65.0 −2.7	21.94 −.03	19.1 −0.6
Nov. 4.4	38.68 .08	41.1 0.9	30.71 .07	58.1 +0.2	56.49 .58	67.5 2.4	21.90 .05	19.7 0.7
14.4	38.59 .10	41.8 0.6	30.64 .08	58.3 0.0	55.83 .71	69.8 2.0	21.84 .07	20.5 0.8
24.3	38.48 .12	42.2 +0.3	30.55 .10	58.2 −0.2	55.07 .81	71.5 1.5	21.76 .09	21.3 0.8
Dec. 4.3	38.35 .13	42.4 0.0	30.44 .11	57.9 0.4	54.22 .87	72.7 0.9	21.66 .10	22.0 0.8
14.3	38.21 −.14	42.3 −0.3	30.32 −.12	57.5 −0.5	53.32 −.91	73.2 −0.3	21.56 −.11	22.9 −0.8
24.2	38.06 .14	41.7 0.6	30.20 .12	56.8 0.7	52.40 .92	73.2 +0.4	21.45 .11	23.6 0.7
34.2	37.92 −.14	41.0 −0.9	30.08 −.12	56.1 −0.8	51.50 −.90	72.5 +1.0	21.33 −.12	24.3 −0.6

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Cassiopeæ.		β Ceti.		21 Cassiopeæ.		ε Piscium.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 0 34	° ′ +55 55	h m 0 37	° ′ −18 35	h m 0 38	° ′ +74 22	h m 0 57	° ′ + 7 17
	s	″	s	″	s	″	s	″
Jan. 0.3	9.07 −.30	32.6 −0.2	57.16 −.13	79.7 −0.6	16.11 −.72	45.7 +0.2	7.21 −.12	7.6 −0.7
10.2	8.77 .30	32.1 0.7	57.03 .13	80.2 0.4	15.38 .73	45.7 −0.4	7.08 .12	6.9 0.7
20.2	8.47 .29	31.1 1.2	56.91 .12	80.4 −0.1	14.65 .71	45.0 1.0	6.96 .12	6.2 0.7
30.2	8.19 .27	29.7 1.6	56.79 .11	80.4 +0.1	13.96 .66	43.7 1.5	6.84 .12	5.5 0.7
Feb. 9.1	7.93 .24	27.8 2.0	56.68 .10	80.1 0.4	13.33 .59	41.9 2.0	6.72 .11	4.8 0.6
19.1	7.71 −.19	25.7 −2.3	56.59 −.08	79.6 +0.7	12.78 −.49	39.7 −2.4	6.62 −.09	4.2 −0.5
29.1	7.54 .14	23.3 2.5	56.52 .05	78.7 1.0	12.34 .37	37.1 2.7	6.53 .07	3.7 0.4
Mar. 10.1	7.43 .08	20.7 2.5	56.48 −.02	77.6 1.2	12.03 .24	34.2 2.9	6.48 −.04	3.3 0.3
20.0	7.39 −.01	18.2 2.5	56.48 +.01	76.3 1.5	11.87 −.08	31.2 3.0	6.46 .00	3.1 −0.1
30.0	7 42 +.07	15.7 2.4	56.51 .05	74.7 1.7	11.86 +.09	28 2 2.9	6.47 +.04	3.2 +0.1
Apr. 9.0	7.52 +.14	13.4 −2 2	56.59 +.09	72.9 +1.9	12.00 +.22	25.3 −2.8	6.53 +.08	3.4 +0.4
19.0	7.70 .21	11.3 1.9	56.70 .14	70.9 2.2	12.30 .37	22.7 2.6	6.63 .12	4.0 0.6
28.9	7.95 .28	9.7 1.4	56.86 .18	68.7 2.2	12.73 .50	20.2 2.2	6.77 .16	4.7 0.9
May 8.9	8.26 .34	8.4 1.0	57.06 .22	66.5 2.3	13.29 .61	18.4 1.7	6.95 .20	5.8 1.2
18.9	8.63 .39	7.6 0.6	57.29 .25	64.1 2.4	13.96 .71	16.9 1.2	7.17 .24	7.1 1.4
28.8	9.04 +.43	7.3 −0.1	57.56 +.28	61.7 +2.3	14.72 +.79	16.0 −0.7	7.42 +.27	8.6 +1.6
June 7.8	9.48 .45	7.5 +0.4	57.85 .30	59.4 2.3	15.54 .84	15.5 −0.2	7.70 .29	10.3 1.8
17.8	9.95 .47	8.1 0.9	58.16 .32	57.2 2.2	16.40 .87	15.6 +0.1	8.00 .30	12.1 1.9
27.8	10.42 .47	9.3 1.4	58.48 .32	55.1 2.0	17.27 .87	16.3 0.9	8.31 .31	14.0 1.9
July 7.7	10.89 .46	10.9 1.8	58.81 .32	53.2 1.7	18.14 .85	17.5 1.5	8.62 .31	16.0 2.0
17.7	11.34 +.44	12.9 +2.2	59.12 +.31	51.6 +1.5	18.97 +.81	19.2 +1.9	8.92 +.30	18.0 +2.0
27.7	11.76 .40	15.3 2.5	59.42 .29	50.3 1.1	19.75 .75	21.4 2.4	9.21 .28	19.9 1.9
Aug. 6.7	12.14 .36	18.0 2.8	59.70 .26	49.3 0.8	20.46 .68	23.9 2.7	9.49 .26	21.7 1.7
16.6	12.48 .31	20.9 3.0	59.94 .23	48.7 0.5	21.10 .59	26.8 3.1	9.73 .23	23.4 1.6
26.6	12.77 .26	23.9 3.1	60.16 .20	48.4 +0.1	21.63 .48	30.0 3.3	9.95 .20	24.8 1.4
Sept. 5.6	13.01 +.20	27.1 +3.2	60.33 +.16	48.5 −0.2	22.07 +.38	33.5 +3.5	10.13 +.17	26.1 +1.1
15.5	13.18 .15	30.3 3.2	60.47 .12	48.9 0.5	22.39 .27	37.0 3.6	10.28 .13	27.1 0.9
25.5	13.31 .09	33.5 3.2	60.57 .08	49.6 0.8	22.60 .15	40.7 3 7	10 40 .10	28.0 0.7
Oct. 5.5	13.37 +.04	36.7 3.1	60.63 .04	50.6 1.1	22.69 +.02	44.4 3.6	10.48 .06	28.5 0.5
15.5	13 38 −.02	39.7 2.9	60.66 +.01	51.7 1.2	22.66 −.09	47.9 3.5	10.53 +.03	28.9 0.3
25.4	13.33 −.07	42.5 +2.6	60.65 −.02	53.0 −1.3	22.52 −.20	51.4 +3.3	10.55 .00	29.1 +0.1
Nov. 4.4	13.24 .12	45.0 2.3	60.62 .05	54.4 1.4	22.26 .31	54.6 3.0	10.54 −.02	29.1 −0.1
14.4	13.09 .16	47.2 2.0	60.55 .07	55.7 1.3	21.89 .41	57 5 2.7	10.51 .04	28 9 0.2
24.3	12.91 .20	49.0 1.6	60.47 .09	57.1 1.2	21.43 .51	60.0 2.3	10.45 .06	28.6 0.4
Dec. 4.3	12.69 .24	50.3 1.1	60.37 .11	58.2 1.1	20.87 .59	62.0 1.8	10.38 .08	28.1 0.5
14.3	12.44 −.26	51.2 +0.6	60.26 −.12	59.3 −1.0	20.24 −.66	63.6 +1.2	10.29 −.10	27.6 −0.6
24.3	12.16 .28	51.6 +0.1	60.14 .12	60.1 0.7	19.56 .70	64.5 0.7	10.18 .11	27.0 0.6
34.2	11.87 −.30	51.5 −0.4	60.01 −.13	60.8 −0.5	18.83 −.73	64.9 +0.1	10.07 −.12	26.3 −0.7

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	β Andromedæ.		θ¹ Ceti.		38 Cassiopeæ.		η Piscium.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 1 3	° ′ +35 1	h m 1 18	° ′ −− 8 45	h m 1 22	° ′ +69 40	h m 1 25	° ′ +14 45
	s	″	s	″	s	″	s	″
Jan. 0.3	27.38 −.16	39.2 −0.3	24.92 −.12	52.9 −0.8	54.96 −.50	87.1 +0.7	29.01 −.12	62.1 −0.5
10.2	27.22 .17	38.7 0.6	24.79 .13	53.6 0.6	54.44 .53	87.5 +0.2	28.89 .13	61.5 0.6
20.2	27.04 .17	37.9 0.9	24.66 .13	54.2 0.5	53.90 .54	87.4 −0.4	28.75 .14	60.8 0.7
30.2	26.87 .17	36.8 1.2	24.53 .13	54.6 0.3	53.35 .53	86.6 1.0	28.61 .14	60.0 0.8
Feb. 9.2	26.70 .16	35.5 1.4	24.41 .12	54.8 −0.1	52.83 .50	85.4 1.5	28.48 .13	59.2 0.8
19.1	26.55 −.13	34.0 −1.6	24.29 −.11	54.7 +0.1	52.35 −.45	83.6 −2.0	28.35 −.12	58.4 −0.8
29.1	26.43 .10	32.4 1.7	24.19 .08	54.5 0.4	51.94 .37	81.5 2.3	28.24 .10	57.7 0.7
Mar. 10.1	26.35 .06	30.7 1.7	24.12 .06	54.0 0.6	51.61 .28	79.0 2.6	28.16 .07	57.0 0.6
20.1	26.30 −.02	29.1 1.6	24.08 −.03	53.2 0.8	51.39 .17	76.3 2.7	28.11 −.03	56.4 0.5
30.0	26.30 +.03	27.5 1.4	24.07 +.01	52.3 1.1	51.27 −.05	73.5 2.8	28.09 +.01	56.0 0.3
Apr. 9.0	26.35 +.08	26.2 −1.2	24.10 +.05	51.0 +1.3	51.28 +.07	70.7 −2.7	28.12 +.05	55.8 −0.1
19.0	26.46 .13	25.1 0.9	24.17 .09	49.6 1.5	51.41 .19	68.1 2.5	28.19 .09	55.9 +0.2
28.9	26.62 .18	24.3 0.6	24.29 .14	47.9 1.8	51.65 .30	65.6 2.3	28.31 .14	56.2 0.4
May 8.9	26.83 .23	23.8 −0.3	24.45 .18	46.1 2.0	52.02 .41	63.5 1.9	28.48 .18	56.7 0.7
18.9	27.08 .27	23.7 +0.1	24.65 .22	44.1 2.1	52.48 .50	61.8 1.5	28.68 .22	57.6 0.9
28.9	27.37 +.31	24.0 +0.5	24.88 +.25	42.0 +2.1	53.02 +.58	60.5 −1.0	28.92 +.25	58.7 +1.2
June 7.8	27.69 .33	24.7 0.9	25.15 .28	39.8 2.2	53.64 .64	59.7 −0.5	29.19 .28	60.0 1.4
17.8	28.03 .35	25.7 1.2	25.43 .29	37.6 2.1	54.31 .68	59.4 0.0	29.48 .30	61.6 1.6
27.8	28.39 .36	27.0 1.5	25.74 .31	35.5 2.1	55.01 .71	59.6 +0.5	29.79 .31	63.2 1.7
July 7.8	28.75 .35	28.7 1.8	26.05 .31	33.5 1.9	55.72 .71	60.3 1.0	30.11 .31	65.1 1.9
17.7	29.10 +.34	30.6 +2.0	26.35 +.30	31.6 +1.8	56.43 +.70	61.5 +1.5	30.42 +.31	67.0 +1.9
27.7	29.43 .32	32.7 2.2	26.65 .29	30.0 1.5	57.11 .67	63.2 1.9	30.73 .30	68.9 1.9
Aug. 6.7	29.74 .30	35.0 2.3	26.94 .27	28.6 1.3	57.76 .63	65.3 2.3	31.02 .28	70.8 1.9
16 6	30.03 .27	37.4 2.4	27.20 .25	27.4 1.0	58.37 .57	67.8 2.6	31.29 .25	72.6 1.8
26.6	30.28 .23	39.8 2.4	27.43 .22	26.6 0.7	58.91 .51	70.5 2.9	31.53 .23	74.3 1.6
Sept. 5.6	30.50 +.20	42.2 +2.4	27.63 +.19	26.1 +0.3	59 38 +.43	73.6 +3.2	31.74 +.20	75.9 +1.5
15.6	30.67 .16	44.6 2.3	27.80 .15	26.0 0.0	59.77 .35	76.8 3.3	31.92 .16	77.3 1.3
25.5	30.81 .12	46.9 2.2	27.94 .12	26.1 −0.2	60.08 .27	80.3 3.4	32.06 .13	78.5 1.0
Oct. 5.5	30.91 .08	49.0 2.1	28.04 .08	26.5 0.5	60.31 .18	83.7 3.4	32.18 .10	79.5 0.9
15.5	30.97 .04	51.0 1.9	28.11 .05	27.1 0.7	60.44 +.09	87.1 3.4	32.26 .07	80.3 0.7
25.5	30.99 +.01	52.8 +1.7	28.15 +.02	27.9 −0.9	60.49 .00	90.5 +3.3	32.31 +.03	80.9 +0.5
Nov. 4.4	30.98 −.03	54.4 1.5	28.15 −.01	28.9 1.0	60.44 −.09	93.8 3.1	32.33 +.01	81.3 0.3
14.4	30.94 .06	55.8 1.2	28.13 .03	29.9 1.1	60.30 .18	96.8 2.9	32.32 −.02	81.5 +0.1
24.4	30.87 .08	56.8 0.9	28.09 .06	31.0 1.1	60.07 .27	99.5 2.5	32.29 .05	81.6 −0.2
Dec. 4.3	30.77 .11	57.5 0.6	28.02 .08	32.0 1.0	59.76 .34	101.8 2.1	32.23 .07	81.5 0.2
14.3	30.65 −.13	58.0 +0.3	27.94 −.09	33.0 −1.0	59.38 −.41	103.7 +1.6	32.15 −.09	81.3 −0.3
24.3	30.51 .15	58.1 −0.1	27.83 .11	34.0 0.9	58.95 .47	105.1 1.1	32.05 .11	80.9 0.4
34.3	30.35 −.16	57.8 −0.4	27.72 −.12	34.8 −0.8	58.44 −.53	105.9 +0.5	31.94 −.13	80.4 −0.5

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Eridani. (*Achernar.*)		o Piscium.		β Arietis.		50 Cassiopeæ.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 1 33	° ′ −57 47	h m 1 39	° ′ + 8 35	h m 1 48	° ′ +20 15	h m 1 53	° ′ +71 52
	s	″	s	″	s	″	s	″
Jan. 0.3	31.65 −.32	106.2 −0.8	28.40 −.11	31.0 −0.6	26.94 −.12	34.5 −0.3	54.17 −.53	53.9 +1.2
10.3	31.32 .33	106.7 −0.2	28.28 .12	30.4 0.6	26.81 .13	34.1 0.5	53.61 .58	54.8 +0.6
20.2	30.99 .33	106.5 +0.4	28.15 .13	29.7 0.6	26.67 .14	33 5 0.6	53.01 .61	55.1 0.0
30.2	30.67 .32	105.8 1.0	28.02 .14	29.1 0.6	26.52 .15	32.8 0.7	52.38 .62	54.8 −0.6
Feb. 9.2	30.36 .30	104.5 1.5	27.88 .13	28.5 0.6	26.37 .15	32.0 0.8	51.76 .60	54.0 1.1
19.2	30.07 −.27	102.8 +2.0	27.75 −.12	27.9 −0.5	26.23 −.14	31.2 −0.9	51.18 −.56	52.6 −1.6
29.1	29.82 .23	100.6 2.4	27.64 .10	27.4 0.4	26.10 .12	30.3 0.9	50.65 .48	50.8 2.0
Mar. 10.1	29.61 .18	98.0 2.8	27.55 .08	27.0 0.3	25.99 .09	29.4 0.8	50.21 .39	48.5 2.4
20.1	29.45 .13	95.0 3.1	27.48 .04	26.8 −0.1	25.91 .06	28.6 0.7	49.87 .28	46.0 2.6
30.0	29.36 −.06	91.8 3.3	27.46 −.01	26.8 +0.1	25.87 −.02	27.9 0.6	49.65 .16	43.3 2.7
Apr. 9.0	29.32 .00	88.4 +3.5	27.47 +.04	27.0 +0.3	25.88 +.03	27.4 −0.4	49.56 −.02	40.5 −2.8
19.0	29.36 +.07	84.8 3.6	27.53 .08	27.4 0.5	25.93 .07	27.1 −0.2	49.60 +.11	37.8 2.7
29.0	29 47 .14	81.2 3.6	27.63 .12	28.0 0.8	26.03 .12	27.0 +0.1	49.79 .25	35.2 2.5
May 8.9	29.65 .21	77.6 3.5	27.78 .17	28.9 1.0	26.17 .17	27.2 0.3	50.10 .37	32.8 2.2
18.9	29.89 .28	74.2 3.4	27.96 .21	30.0 1.2	26.36 .21	27.7 0.6	50.53 .49	30.8 1.9
28.9	30.20 +.34	70.9 +3.2	28.19 +.24	31.4 +1.4	26.60 +.25	28.4 +0.9	51.07 +.58	29.1 −1.4
June 7.9	30.56 .39	67.8 2.9	28.45 .27	32.9 1.6	26.86 .28	29.4 1.1	51.70 .67	27.9 1.0
17.8	30.97 .43	65.1 2.5	28.73 .29	34.6 1.7	27.15 .30	30.7 1.3	52.40 .73	27.2 −0.5
27.8	31.42 .46	62.8 2.1	29.03 .30	36.4 1.8	27.46 .32	32.1 1.5	53.16 .77	27.0 +0.1
July 7.8	31.90 .48	61.0 1.6	29.34 .31	38.3 1.9	27.78 .32	33.7 1.7	53.94 .79	27.2 0.6
17.7	32.38 +.48	59.7 +1.1	29.65 +.31	40.2 +1.9	28.10 +.32	35.5 +1.8	54.73 +.79	28.0 +1.0
27.7	32.86 .47	58.9 +0.5	29.95 .30	42.0 1.8	28.42 .31	37.3 1.8	55.52 .79	29.2 1.5
Aug. 6.7	33.33 .45	58.6 −0.1	30.24 .28	43.8 1.7	28.72 .29	39.2 1.9	56.28 .74	30.9 1.9
16.7	33.77 .42	59.0 0.6	30.51 .26	45.4 1.6	29.01 .27	41.0 1.8	57.00 .69	33.0 2.3
26.6	34.17 .38	59.9 1.2	30.76 .23	46.9 1.4	29.27 .25	42.8 1.7	57.67 .63	35.4 2.6
Sept. 5.6	34.52 +.32	61.3 −1.7	30.98 +.20	48.1 +1.2	29.50 +.23	44.5 +1.6	58.27 +.56	38.2 +2.9
15.6	34.81 .26	63.3 2.1	31.16 .17	49.2 1.0	29.71 .19	46.1 1.5	58.79 .48	41.3 3.1
25.6	35.04 .19	65.6 2.5	31.32 .14	50.1 0.7	29.88 .16	47.5 1.4	59.23 .40	44.5 3.3
Oct. 5.5	35.20 .12	68.2 2.7	31.45 .11	50.7 0.5	30.02 .12	48.8 1.2	59.58 .30	47.8 3.4
15.5	35.28 +.05	71.0 2.9	31.54 .08	51.1 0.3	30.12 .09	49.9 1.0	59.83 .20	51.3 3.4
25.5	35.30 −.02	74.1 −2.9	31.60 +.05	51.3 +0.1	30.21 +.06	50.8 +0.8	59.99 +.10	54.7 +3.4
Nov. 4.5	35.25 .08	76.9 2.8	31.64 +.02	51.4 0.0	30.25 +.03	51.5 0.6	60.03 −.01	58.1 3.3
14.4	35.14 .14	79.7 2.7	31.64 −.01	51.3 −0.2	30.27 .00	52.1 0.5	59.97 .10	61.2 3.1
24.4	34.97 .19	82.2 2.4	31.62 .03	51.0 0.3	30.25 −.03	52.5 0.3	59.80 .22	64.2 2.8
Dec. 4.4	34.75 .24	84.4 2.0	31.57 .06	50.6 0.4	30.21 .05	52.7 +0.1	59.53 .31	66.9 2.5
14.3	34.50 −.27	86.1 −1.5	31.51 −.08	50.2 −0.5	30.14 −.08	52.7 −0.1	59.18 −.40	69.1 +2.0
24.3	34.20 .30	87.4 1.0	31.42 .10	49.6 0.6	30.05 .10	52.6 0.2	58.72 .49	70.9 1.5
34.3	33.89 −.32	88.2 −0.4	31.31 −.12	49.0 −0.6	29.94 −.12	52.3 −0.3	58.20 −.56	72.2 +1.0

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Arietis.		ξ¹ Ceti.		ι Cassiopeæ.		ξ² Ceti.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m s 2 0	° ′ ″ +22 55	h m s 2 7	° ′ ″ + 8 19	h m s 2 19	° ′ ″ +66 53	h m s 2 22	° ′ ″ + 7 57
Jan. 0.3	51.45 −.12	55.1 −0.2	3.62 −.10	8.7 −0.6	51.54 −.38	61.7 +1.3	12.12 −.09	20.3 −0.6
10.3	51.32 .14	54.8 0.4	3.50 .12	8.1 0.6	51.14 .42	62.8 0.8	12.02 .12	19.7 0.6
20.3	51.17 .15	54.3 0.6	3.37 .13	7.5 0.6	50.70 .46	63.4 +0.3	11.89 .13	19.1 0.6
30.2	51.02 .16	53.7 0.7	3.23 .14	7.0 0.6	50.23 .48	63.4 −0.3	11.75 .14	18.6 0.5
Feb. 9.2	50.86 .16	52.9 0.8	3.09 .14	6.4 0.5	49.75 .48	62.8 0.8	11.60 .15	18.0 0.5
19.2	50.71 −.15	52.0 −0.9	2.95 −.14	5.9 −0.5	49.28 −.45	61.8 −1.3	11.45 −.14	17.6 −0.4
29.2	50.56 .13	51.1 0.9	2.81 .12	5.5 0.4	48.84 .41	60.2 1.7	11.31 .13	17.2 0.3
Mar. 10.1	50.44 .10	50.2 0.9	2.70 .10	5.1 0.2	48.46 .34	58.3 2.1	11.19 .11	16.9 0.2
20.1	50.36 .07	49.3 0.8	2.62 .07	5.0 −0.1	48.15 .26	56.1 2.3	11.09 .08	16.7 −0.2
30.1	50.31 −.03	48.5 0.7	2.56 −.03	5.0 +0.1	47.93 .17	53.6 2.5	11.02 .05	16.8 +0.1
Apr. 9.0	50.29 +.01	47.8 −0.6	2.55 +.01	5.1 +0.2	47.82 −.07	51.1 −2.6	11.00 −.01	17.0 +0.3
19.0	50.34 .06	47.3 0.4	2.58 .05	5.5 0.5	47.80 +.04	48.5 2.5	11.01 +.04	17.4 0.5
29.0	50.42 .11	47.1 −0.1	2.66 .10	6.2 0.7	47.90 .15	46.0 2.4	11.07 .08	18.0 0.7
May 9.0	50.56 .16	47.1 +0.1	2.78 .14	7.0 1.0	48.11 .26	43.7 2.2	11.18 .13	18.8 0.9
18.9	50.74 .20	47.4 0.4	2.94 .18	8.1 1.2	48.42 .35	41.7 1.9	11.33 .17	19.9 1.2
28.9	50.97 +.24	47.9 +0.7	3.15 +.22	9.4 +1.4	48.82 +.44	40.0 −1.5	11.52 +.21	21.1 +1.3
June 7.9	51.23 .27	48.7 1.0	3.38 .25	10.8 1.5	49.30 .51	38.7 1.1	11.75 .24	22.6 1.5
17.8	51.52 .30	49.8 1.2	3.65 .28	12.4 1.7	49.84 .57	37.9 0.6	12.01 .27	24.2 1.6
27.8	51.83 .32	51.1 1.4	3.94 .30	14.2 1.8	50.44 .62	37.5 −0.2	12.29 .29	25.9 1.7
July 7.8	52.15 .33	52.6 1.6	4.24 .30	16.0 1.8	51.08 .64	37.5 +0.3	12.59 .30	27.6 1.8
17.8	52.48 +.33	54.2 +1.7	4.55 +.31	17.8 +1.8	51.73 +.65	38.1 +0.8	12.89 +.31	29.4 +1.8
27.7	52.80 .32	56.0 1.8	4.85 .30	19.6 1.7	52.38 .65	39.1 1.2	13.20 .30	31.2 1.7
Aug. 6.7	53.12 .31	57.8 1.8	5.15 .29	21.3 1.6	52.03 .63	40.5 1.6	13.50 .29	32.8 1.6
16.7	53.41 .28	59.6 1.8	5.43 .27	22.8 1.5	53.64 .60	42.3 2.0	13.78 .28	34.3 1.5
26.7	53.68 .26	61.4 1.8	5.70 .25	24.2 1.3	54.23 .56	44.4 2.3	14.05 .26	35.7 1.4
Sept. 5.6	53.93 +.23	63.2 +1.7	5.93 +.22	25.5 +1.1	54.76 +.51	46.9 +2.6	14.30 +.23	36.9 +1.1
15.6	54.15 .20	64.8 1.6	6.14 .20	26.5 0.9	55.25 .45	49.6 2.9	14.52 .21	37.9 0.9
25.6	54.34 .17	66.3 1.5	6.33 .17	27.3 0.7	55.67 .39	52.5 3.0	14.72 .18	38.6 0.6
Oct. 5.5	54.49 .14	67.7 1.3	6.48 .14	27.8 0.5	56.02 .32	55.6 3.1	14.88 .15	39.1 0.4
15.5	54.62 .11	68.9 1.1	6.60 .11	28.2 0.3	56.30 .24	58.8 3.2	15.02 .12	39.4 +0.2
25.5	54.71 +.08	70.0 +1.0	6.69 +.08	28.4 +0.1	56.51 +.16	62.0 +3.2	15.13 +.09	39.6 0.0
Nov. 4.5	54.77 .04	70.9 0.8	6.75 .05	28.4 −0.1	56.63 +.08	65.1 3.1	15.20 .06	39.5 −0.1
14.4	54.80 +.01	71.6 0.6	6.78 +.02	28.2 0.2	56.67 .00	68.2 3.0	15.25 +.03	39.3 0.3
24.4	54.79 −.02	72.2 0.5	6.79 −.01	27.9 0.3	56.62 −.09	71.0 2.7	15.27 .00	39.0 0.4
Dec. 4.4	54.76 .05	72.5 0.3	6.76 .04	27.5 0.4	56.49 .17	73.7 2.4	15.26 −.02	38.5 0.4
14.4	54.70 −.07	72.7 +0.1	6.71 −.06	27.1 −0.5	56.28 −.25	75.9 +2.1	15.22 −.05	38.1 −0.5
24.3	54.62 .10	72.7 −0.1	6.63 .09	26.5 0.5	55.99 .32	77.8 1.6	15.15 .08	37.5 0.5
34.3	54.51 −.12	72.5 −0.3	6.54 −.11	26.0 −0.5	55.63 −.39	79.2 +1.1	15.06 −.11	37.0 −0.6

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	γ Ceti.		α Ceti.		48 Cephei (H.)		ζ Arietis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m s 2 37	° ′ ″ + 2 45	h m s 2 56	° ′ ″ + 3 38	h m s 3 6	° ′ ″ +77 19	h m s 3 8	° ′ ″ +20 37
	s	″	s	″	s	″	s	″
Jan. 0.3	29.73 −.09	39.2 −0.8	25.48 −.08	50.7 −0.7	11.12 −.60	25.8 +2.2	27.97 −.08	39.5 −0.1
10.3	29.63 .11	38.5 0.7	25.39 .11	50.0 0.7	10.45 .73	27.7 1.7	27.87 .11	39.4 0.2
20.3	29.50 .13	37.9 0.6	25.27 .13	49.3 0.6	9.67 .82	29.1 1.1	27.75 .13	39.2 0.3
30.3	29.36 .14	37.3 0.5	25.13 .14	48.8 0.5	8.80 .89	29.9 +0.5	27.61 .15	38.9 0.4
Feb. 9.2	29.21 .15	36.8 0.4	24.98 .15	48.3 0.4	7.89 .92	30.1 −0.1	27.44 .17	38.4 0.5
19.2	29.06 −.15	36.5 −0.3	24.82 −.15	47.9 −0.3	6.97 −.91	29.7 −0.7	27.27 −.17	37.9 −0.5
29.2	28.92 .14	36.2 −0.1	24.67 .15	47.7 −0.2	6.07 .86	28.8 1.2	27.10 .17	37.4 0.6
Mar. 10.2	28.78 .12	36.2 0.0	24.53 .13	47.6 0.0	5.24 .77	27.3 1.7	26.94 .15	36.8 0.6
20.1	28.67 .09	36.2 +0.2	24.40 .11	47.6 +0.1	4.52 .66	25.4 2.1	26.80 .13	36.2 0.6
30.1	28.60 .06	36.5 0.4	24.31 .08	47.9 0.3	3.93 .51	23.2 2.4	26.69 .09	35.7 0.5
Apr. 9.1	28.55 −.02	37.0 +0.6	24.25 −.04	48.3 +0.5	3.50 −.34	20.6 −2.6	26.62 −.05	35.2 −0.4
19.0	28.55 +.02	37.7 0.8	24.23 .00	48.9 0.7	3.26 −.15	17.9 2.8	26.59 −.01	34.9 0.3
29.0	28.60 .07	38.6 1.0	24.26 +.05	49.7 0.9	3.20 +.03	15.1 2.8	26.61 +.04	34.7 −0.1
May 9.0	28.68 .11	39.7 1.2	24.33 .09	50.7 1.1	3.33 .23	12.4 2.7	26.68 .09	34.7 +0.1
19.0	28.82 .15	41.0 1.4	24.44 .14	52.0 1.3	3.65 .41	9.8 2.5	26.80 .14	34.9 0.3
28.9	28.99 +.19	42.5 +1.6	24.60 +.18	53.4 +1.5	4.14 +.57	7.4 −2.2	26.96 +.18	35.3 +0.5
June 7.9	29.20 .23	44.2 1.7	24.80 .22	55.0 1.6	4.80 .72	5.3 1.9	27.16 .22	36.0 0.7
17.9	29.45 .26	45.9 1.8	25.03 .25	56.6 1.7	5.59 .85	3.6 1.5	27.41 .26	36.8 0.9
27.9	29.72 .28	47.7 1.8	25.30 .27	58.4 1.8	6.50 .96	2.4 1.1	27.68 .28	37.8 1.1
July 7.8	30.01 .29	49.6 1.8	25.58 .29	60.2 1.8	7.51 1.04	1.5 0.6	27.97 .30	39.0 1.2
17.8	30.31 +.30	51.4 +1.8	25.87 +.30	62.0 +1.7	8.58+1.09	1.2 −0.1	28.28 +.31	40.3 +1.3
27.8	30.61 .30	53.2 1.7	26.17 .30	63.6 1.6	9.69 1.12	1.3 +0.3	28.60 .32	41.6 1.4
Aug. 6.7	30.91 .29	54.8 1.5	26.47 .30	65.2 1.5	10.82 1.12	1.8 0.8	28.92 .31	43.1 1.4
16.7	31.20 .28	55.2 1.3	26.76 .29	66.7 1.3	11.94 1.11	2.9 1.2	29.23 .31	44.5 1.4
26.7	31.47 .26	57.4 1.1	27.04 .27	67.9 1.1	13.03 1.07	4.3 1.7	29.53 .29	45.9 1.4
Sept. 5.7	31.72 +.24	58.4 +0.8	27.31 +.25	68.9 +0.9	14.08+1.01	6.2 +2.1	29.82 +.27	47.2 +1.3
15.6	31.95 .22	59.1 0.5	27.55 .23	69.6 0.6	15.06 .93	8.5 2.4	30.08 .25	48.5 1.2
25.6	32.15 .19	59.6 0.3	27.77 .21	70.1 0.4	15.95 .84	11.1 2.7	30.32 .23	49.6 1.1
Oct. 5.6	32.33 .16	59.8 +0.1	27.96 .18	70.3 +0.1	16.74 .73	14.0 3.0	30.54 .20	50.6 1.0
15.6	32.48 .13	59.8 −0.1	28.13 .15	70.3 −0.1	17.41 .61	17.1 3.2	30.73 .18	51.5 0.8
25.5	32.60 +.10	59.6 −0.3	28.26 +.12	70.1 −0.3	17.96 +.47	20.3 +3.3	30.90 +.15	52.3 +0.7
Nov. 4.5	32.69 .07	59.2 0.5	28.37 .10	69.7 0.5	18.35 .32	23.7 3.4	31.03 .12	52.9 0.6
14.5	32.75 .05	58.6 0.6	28.45 .06	69.2 0.6	18.59 +.16	27.1 3.4	31.13 .09	53.4 0.4
24.4	32.78 +.02	58.0 0.7	28.50 +.03	68.6 0.7	18.67 −.01	30.4 3.3	31.20 .05	53.8 0.3
Dec. 4.4	32.78 −.01	57.3 0.7	28.52 .00	67.9 0.7	18.57 .18	33.6 3.1	31.23 +.02	54.1 0.2
14.4	32.75 −.04	56.5 −0.7	28.51 −.03	67.1 −0.7	18.31 −.34	36.6 +2.8	31.23 −.02	54.2 +0.1
24.4	32.69 .07	55.8 0.7	28.46 .06	66.4 0.7	17.88 .50	39.2 2.4	31.20 .05	54.3 0.0
34.3	32.61 −.09	55.1 −0.7	28.39 −.09	65.7 −0.7	17.30 −.65	41.4 +2.0	31.13 −.08	54.3 −0.1

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Persei.		ε Eridani.		δ Persei.		η Tauri.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 3 16	° ′ +49 27	h m 3 27	° ′ − 9 50	h m 3 34	° ′ +47 25	h m 3 40	° ′ +23 45
	s	″	s	″	s	″	s	″
Jan. 0.4	20.35 −.13	44.8 +1.2	39.37 −.08	28.1 −1.3	57.77 −.10	44.0 +1.2	49.87 −.05	25.0 +0.1
10.3	20.19 .18	45.8 0.8	39.28 .10	29.2 1.1	57.64 .15	45.1 0.9	49.80 .09	25.1 0.0
20.3	19.99 .22	46.5 0.5	39.16 .13	30.2 0.9	57.47 .19	45.8 0.6	49.69 .13	25.1 −0.1
30.3	19.76 .25	46.8 +0.1	39.02 .14	30.9 0.6	57.25 .23	46.3 +0.3	49.55 .15	24.9 0.2
Feb. 9.3	19.50 .27	46.8 −0.3	38.86 .15	31.4 0.4	57.01 .25	46.4 −0.1	49.39 .17	24.7 0.3
19.2	19.23 −.27	46.3 −0.6	38.69 −.17	31.7 −0.1	56.75 −.26	46.1 −0.4	49.21 −.18	24.4 −0.4
29.2	18.96 .26	45.5 1.0	38.52 .17	31.7 +0.1	56.49 .26	45.5 0.8	49.02 .18	23.9 0.5
Mar. 10.2	18.70 .24	44.4 1.3	38.35 .16	31.4 0.4	56.24 .24	44.6 1.0	48.85 .17	23.4 0.5
20.1	18.48 .20	43.0 1.5	38.20 .14	30.9 0.6	56.01 .21	43.4 1.3	48.68 .15	22.9 0.6
30.1	18.30 −.15	41.4 1.6	38.08 .11	30.1 0.9	55.82 .16	42.0 1.5	48.55 .12	22.3 0.5
Apr. 9.1	18.18 −.09	39.7 −1.7	37.98 −.08	29.1 +1.2	55.68 −.11	40.5 −1.6	48.44 −.08	21.8 −0.5
19.1	18.11 −.03	37.9 1.7	37.93 −.03	27.8 1.4	55.60 −.05	38.9 1.6	48.39 −.03	21.3 0.4
29.0	18.12 +.04	36.2 1.7	37.91 +.01	26.3 1.6	55.58 +.02	37.3 1.6	48.37 +.01	20.9 0.3
May 9.0	18.19 .11	34.6 1.5	37.95 .05	24.6 1.8	55.63 .08	35.7 1.5	48.41 .06	20.7 −0.1
19.0	18.33 .17	33.1 1.3	38.02 .10	22.7 2.0	55.74 .14	34.3 1.3	48.50 .11	20.7 0.0
29.0	18.53 +.23	31.9 −1.1	38.15 +.14	20.6 +2.1	55.91 +.21	33.2 −1.1	48.63 +.16	20.8 +0.2
June 7.9	18.80 .29	31.0 0.8	38.31 .18	18.4 2.2	56.15 .26	32.2 0.8	48.81 .20	21.1 0.4
17.9	19.11 .34	30.3 0.5	38.51 .22	16.2 2.2	56.44 .31	31.5 0.5	49.03 .24	21.6 0.6
27.9	19.47 .37	30.0 −0.2	38.74 .25	14.0 2.2	56.77 .35	31.1 −0.2	49.29 .27	22.3 0.8
July 7.8	19.86 .40	30.0 +0.2	39.00 .27	11.8 2.1	57.14 .38	31.0 +0.1	49.57 .29	23.2 0.9
17.8	20.27 +.42	30.3 +0.5	39.28 +.28	9.8 +1.9	57.53 +.40	31.2 +0.3	49.88 +.31	24.2 +1.0
27.8	20.70 .43	30.9 0.8	39.57 .29	7.9 1.7	57.94 .41	31.7 0.6	50.19 .32	25.3 1.2
Aug. 6.8	21.13 .43	31.9 1.1	39.87 .29	6.3 1.5	58.35 .42	32.5 0.9	50.51 .32	26.4 1.2
16.7	21.56 .42	33.1 1.4	40.16 .29	4.9 1.2	58.77 .41	33.5 1.1	50.83 .32	27.7 1.2
26.7	21.98 .41	34.6 1.6	40.44 .28	3.9 0.9	59.18 .40	34.8 1.3	51.15 .31	28.9 1.2
Sept. 5.7	22.37 +.38	36.3 +1.8	40.71 +.26	3.2 +0.5	59.57 +.38	36.2 +1.5	51.45 +.30	30.1 +1.2
15.7	22.74 .36	38.1 1.9	40.97 .25	2.9 +0.1	59.94 .36	37.8 1.7	51.74 .28	31.2 1.1
25.6	23.09 .33	40.1 2.1	41.21 .23	3.0 −0.2	60.30 .34	39.6 1.8	52.01 .26	32.3 1.0
Oct. 5.6	23.40 .29	42.2 2.1	41.42 .20	3.4 0.6	60.62 .31	41.5 1.9	52.26 .24	33.3 0.9
15.6	23.67 .25	44.4 2.2	41.61 .17	4.1 0.9	60.91 .27	43.4 2.0	52.49 .21	34.2 0.8
25.5	23.90 +.21	46.6 +2.2	41.77 +.15	5.1 −1.1	61.16 +.23	45.4 +2.0	52.69 +.19	35.0 +0.7
Nov. 4.5	24.09 .17	48.8 2.2	41.90 .12	6.3 1.3	61.37 .19	47.5 2.0	52.86 .16	35.6 0.6
14.5	24.24 .12	51.0 2.1	42.00 .09	7.7 1.4	61.54 .14	49.4 2.0	53.00 .12	36.2 0.6
24.5	24.33 .07	53.1 2.0	42.07 .05	9.1 1.5	61.66 .09	51.4 1.9	53.11 .09	36.8 0.5
Dec. 4.4	24.37 +.01	55.1 1.9	42.11 +.02	10.6 1.5	61.72 +.04	53.2 1.8	53.18 .05	37.2 0.4
14.4	24.35 −.04	56.8 +1.7	42.11 −.02	12.1 −1.4	61.74 −.01	54.9 +1.6	53.21 +.01	37.5 +0.3
24.4	24.28 .09	58.4 1.4	42.08 .05	13.5 1.3	61.70 .06	56.4 1.4	53.20 −.03	37.8 0.2
34.4	24.16 −.14	59.6 +1.1	42.01 −.08	14.7 −1.1	61.61 −.12	57.7 +1.2	53.15 −.06	38.0 +0.1

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ζ Persei.		γ Eridani.		γ Tauri.		ε Tauri.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 3 47	° ′ +31 32	h m 3 52	° ′ −13 49	h m 4 13	° ′ +15 21	h m 4 22	° ′ +18 55
	s	″	s	″	s	″	s	″
Jan. 0.4	5.91 −.06	58.1 +0.5	48.56 −.06	52.7 −1.5	25.53 −.02	16.8 −0.2	4.96 −.01	46.5 −0.1
10.4	5.83 .10	58.5 0.4	48.49 .09	54.1 1.3	25.48 .06	16.5 0.3	4.93 .06	46.4 0.1
20.3	5.71 .13	58.8 +0.2	48.38 .12	55.3 1.0	25.40 .10	16.3 0.3	4.85 .10	46.3 0.1
30.3	5.56 .16	58.9 0.0	48.24 .15	56.2 0.8	25.28 .13	16.0 0.3	4.73 .13	46.2 0.2
Feb. 9.3	5.38 .19	58.8 −0.2	48.08 .17	56.8 0.5	25.13 .16	15.7 0.3	4.58 .16	46.0 0.2
19.3	5.19 −.20	58.6 −0.4	47.90 −.18	57.1 −0.2	24.97 −.17	15.5 −0.3	4.42 −.17	45.8 −0.2
29.2	4.99 .20	58.1 0.5	47.72 .18	57.2 +0.1	24.79 .18	15.2 0.3	4.24 .18	45.6 0.2
Mar. 10.2	4.79 .19	57.5 0.7	47.54 .17	56.9 0 4	24.61 .17	15.0 0.2	4.05 .18	45.3 0.3
20.2	4.61 .17	56.8 0.8	47.38 .16	56.4 0.7	24.44 .16	14.8 0.2	3.88 .16	45.1 0.3
30.1	4.46 .13	56.0 0.8	47.23 .14	55.5 1.0	24.29 .13	14.6 0.1	3.72 .14	44.8 0.2
Apr. 9.1	4.34 −.09	55.1 −0.8	47.12 −.10	54.4 +1 3	24.17 −.10	14.5 −0.1	3.59 −.11	44.6 −0.2
19.1	4.27 −.05	54.3 0.8	47.04 .06	53.0 1.5	24.09 .06	14.5 +0.1	3.50 .07	44.4 −0.1
29.1	4.25 +.01	53.5 0.7	47.00 −.02	51.4 1.7	24.05 −.02	14.6 0.2	3.45 −.03	44.3 0.0
May 9.0	4.29 .06	52.9 0.6	47.01 +.03	49.5 1.9	24.05 +.03	14.8 0.3	3.45 +.02	44.4 +0.1
19.0	4.37 .11	52.3 0.4	47.06 .08	47.5 2.1	24.10 .07	15.2 0.5	3.50 .07	44.5 0.2
29.0	4.51 +.16	52.0 −0.3	47.16 +.12	45.3 +2.2	24.20 +.12	15.7 +0.6	3.59 +.11	44.9 +0.4
June 8.0	4.69 .21	51.8 0.0	47.30 .16	43.0 2.3	24.34 .16	16.4 0.8	3.73 .16	45.3 0.5
17.9	4.92 .25	51.9 +0.2	47.48 .20	40.6 2.4	24.53 .20	17.3 0.9	3.90 .20	45.9 0.7
27.9	5.19 .28	52.2 0.4	47.70 .23	38.3 2.3	24.75 .23	18.2 1.0	4.12 .23	46.6 0.8
July 7.9	5.49 .31	52.6 0.6	47.94 .26	36.0 2.2	25.00 .26	19.3 1.1	4.37 .26	47.5 0.9
17.8	5.80 +.33	53.3 +0.8	48.20 +.27	33.8 +2.1	25.27 +.28	20.4 +1.2	4.64 +.28	48.4 +1.0
27.8	6.14 .34	54.1 0.9	48.49 .29	31.9 1.8	25.56 .29	21.6 1.2	4.93 .30	49.4 1.0
Aug. 6.8	6.48 .34	55.1 1.0	48.78 .29	30.1 1.5	25.86 .30	22.7 1.1	5.23 .30	50.5 1.0
16.8	6.82 .34	56.2 1.1	49.08 .29	28.8 1.2	26.16 .30	23.9 1.1	5.54 .31	51.5 1.0
26.7	7.16 .33	57.4 1.2	49.37 .29	27.7 0.8	26.46 .30	24.9 1.0	5.85 .31	52.4 0.9
Sept. 5.7	7.49 +.32	58.6 +1.3	49.65 +.28	27.1 +0.5	26.76 +.29	25.8 +0.9	6.16 +.30	53.3 +0.8
15.7	7.80 .30	59.9 1.3	49.92 .26	26.8 +0.1	27.05 .28	26.6 0.7	6.45 .29	54.1 0.7
25.7	8.09 .28	61.1 1.2	50.18 .24	27.0 −0.3	27.32 .27	27.3 0.6	6.74 .28	54.8 0.6
Oct. 5.6	8.36 .26	62.3 1.2	50.41 .22	27.5 0.7	27.58 .25	27.8 0.4	7.01 .26	55.4 0.5
15.6	8.61 .23	63.5 1.2	50.62 .20	28.4 1.0	27.82 .23	28.1 0.3	7.26 .24	55.9 0.4
25.6	8.83 +.20	64.7 +1.1	50.81 +.17	29.6 −1.3	28.04 +.20	28.4 +0.2	7.49 +.22	56.2 +0.3
Nov. 4.5	9.02 .17	65.8 1.1	50.97 .14	31.1 1.5	28.24 .18	28.4 0.0	7.69 .19	56.4 0.2
14.5	9.18 .14	66.9 1.0	51.09 .11	32.7 1.7	28.40 .15	28.4 −0.1	7.87 .16	56.6 0.1
24.5	9.30 .10	67.8 0.9	51.18 .07	34.4 1.8	28.53 .12	28 3 0.2	8.02 .13	56.7 +0.1
Dec. 4.5	9.38 .06	68.8 0.9	51.24 +.04	36.2 1.8	28.63 .08	28.2 0.2	8.13 .09	56.7 0.0
14.4	9.42 +.02	69.6 +0.8	51.26 .00	38.0 −1.7	28.70 +.04	28.0 −0.2	8.20 +.05	56.8 0.0
24.4	9.41 −.03	70.3 0.6	51.25 −.03	39.6 1.6	28.72 .00	27.8 0.2	8.23 +.01	56.7 0.0
34.4	9.36 −.07	70.9 +0.5	51.20 −.07	41.1 −1.4	28.70 −.04	27.6 −0.2	8.22 −.03	56.7 0.0

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Tauri. (*Aldebaran.*)		α Camelopardalis.		ι Aurigæ.		11 Orionis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 4 29	° ′ +16 16	h m 4 42	° ′ +66 8	h m 4 49	° ′ +32 59	h m 4 58	° ′ +15 14
	s	″	s	″	s	″	s	″
Jan. 0.4	30.02 −.01	53.6 −0.2	56.75 −.08	63.9 +2.4	42.56 .00	12.2 +0.7	10.58 +.01	43.2 −0.3
10.4	29.99 .05	53.4 0.2	56.62 .18	66.2 2.2	42.54 −.04	12.9 0.6	10.57 −.03	43.0 0.2
20.4	29.91 .09	53.2 0.2	56.39 .27	68.2 1.8	42.47 .09	13.5 0.5	10.51 .07	42.7 0.2
30.3	29.80 .13	53.0 0.2	56.07 .35	69.9 1.4	42.35 .14	14.0 0.4	10.42 .11	42.5 0.2
Feb. 9.3	29.66 .15	52.8 0.2	55.68 .41	71.1 1.0	42.20 .17	14.3 0.3	10.29 .14	42.4 0.2
19.3	29.50 −.17	52.6 −0.2	55.24 −.46	71.8 +0.5	42.01 −.19	14.5 +0.1	10.14 −.17	42.2 −0.2
29.2	29.32 .18	52.4 0.2	54.77 .48	72.1 0.0	41.81 .21	14.5 −0.1	9.96 .18	42.0 0.1
Mar. 10.2	29.14 .18	52.1 0.2	54.28 .47	71.9 −0.5	41.60 .21	14.3 0.3	9.78 .18	41.9 0.1
20.2	28.96 .17	51.9 0.2	53.82 .45	71.2 0.9	41.39 .20	14.0 0.4	9.60 .18	41.8 −0.1
30.2	28.81 .14	51.8 0.1	53.39 .40	70.1 1.3	41.20 .18	13.5 0.5	9.43 .16	41.8 0.0
Apr. 9.1	28.68 −.12	51.6 −0.1	53.02 −.33	68.5 −1.7	41.03 −.15	12.9 −0 6	9.28 −.13	41.8 0.0
19.1	28.58 .08	51.6 −0.1	52.73 .25	66.7 1.9	40.90 .10	12.2 0.7	9.16 .10	41.8 +0.1
29.1	28.52 −.03	51.7 0.0	52.52 .15	64.7 2.1	40.82 .06	11.5 0.7	9.09 .06	41.9 0.2
May 9.1	28.51 +.01	51.8 +0.1	52.42 −.05	62.5 2.2	40.79 −.01	10.8 0.7	9.05 −.01	42.1 0.3
19.0	28.55 .06	52.1 0.2	52.42 +.05	60.2 2.3	40.81 +.05	10.1 0.6	9.06 +.03	42.5 0.4
29.0	28.63 +.11	52.6 +0.4	52.52 +.15	57.9 −2.2	40.88 +.10	9.6 −0.5	9.12 +.08	42.9 +0.5
June 8.0	28.76 .15	53.2 0.5	52.72 .25	55.8 2.1	41.01 .15	9.1 0.4	9.22 .12	43.5 0.6
17.9	28.93 .19	53.9 0.7	53.02 .34	53.8 1.9	41.18 .19	8.8 0.2	9.36 .16	44.2 0.7
27.9	29.14 .22	54.7 0.8	53.41 .42	52.0 1.7	41.40 .23	8.6 −0.1	9.54 .20	45.0 0.8
July 7.9	29.38 .25	55.7 0.9	53.87 .50	50.5 1.4	41.65 .27	8.6 +0.1	9.76 .23	45.8 0.9
17.9	29.64 +.27	56.7 +1.0	54.40 +.55	49.2 −1.1	41.93 +.30	8.7 +0.2	10.00 +.25	46.8 +0.9
27.8	29.92 .29	57.7 1.0	54.98 .60	48.3 0.7	42.24 .32	9.0 0.3	10.26 .27	47.7 0.9
Aug. 6.8	30.22 .30	58.8 1.0	55.59 .63	47.8 −0.4	42.56 .33	9.4 0.5	10.55 .29	48.6 0.9
16.8	30.52 .30	59.8 1.0	56.24 .65	47.6 0.0	42.90 .34	9.9 0.6	10.84 .29	49.5 0.8
26.8	30.83 .30	60.7 0.9	56.90 .66	47.8 +0.3	43.24 .34	10.5 0.6	11.14 .30	50.3 0.7
Sept. 5.7	31.13 +.30	61.6 +0.8	57.57 +.66	48.3 +0.7	43.59 +.34	11.2 +0.7	11.44 +.30	50.9 +0.6
15.7	31.42 .29	62.3 0.7	58.23 .65	49.1 1.0	43.93 .34	11.9 0.7	11.73 .30	51.6 0.5
25.7	31.70 .28	62.9 0.5	58.87 .63	50.3 1.4	44.26 .33	12.6 0.8	12.03 .29	52.0 0.3
Oct. 5.6	31.97 .26	63.3 0.4	59.49 .60	51.9 1.7	44.58 .31	13.4 0.8	12.31 .27	52.3 0.2
15.6	32.22 .24	63.6 0.2	60.07 .56	53.7 1.9	44.88 .29	14.2 0.8	12.58 .26	52.4 +0.1
25.6	32.46 +.22	63.8 +0.1	60.60 +.50	55 7 +2.2	45.16 +.27	15.0 +0.8	12.83 +.24	52.4 −0.1
Nov. 4.6	32.67 .20	63.9 0.0	61.08 .44	58.0 2.4	45.42 .25	15.8 0.8	13.06 .22	52.3 0.2
14.5	32.85 .17	63.8 −0.1	61.48 .37	60.5 2.6	45.65 .22	16.6 0.8	13.27 .19	52.1 0.2
24.5	33.00 .13	63.7 0.1	61.81 .28	63.1 2.6	45.85 .18	17.4 0.8	13.45 .16	51.8 0.3
Dec. 4.5	33.12 .10	63.6 0.2	62.04 .19	65.8 2.7	46.00 .13	18.3 0.8	13.59 .13	51.5 0.3
14.5	33.20 +.06	63.4 −0.2	62.18 +.09	68.5 +2.7	46.12 +.09	19.1 +0.8	13.70 +.09	51.2 −0.3
24.4	33.23 +.02	63.2 0.2	62.22 − 02	71.1 2.5	46.18 +.04	19.9 0.8	13.77 +.04	51.0 0.3
34.4	33.23 −.02	63.1 −0.2	62.16 −.12	73.6 +2.3	46.19 −.01	20.7 +0.7	13.79 .00	50.7 −0.3

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Aurigæ. (*Capella.*)		β Orionis. (*Rigel.*)		β Tauri.		Groombridge 966.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 5 8	° ′ +45 52	h m 5 9	° ′ − 8 19	h m 5 19	° ′ +28 30	h m 5 24	° ′ +74 57
	s	″	s	″	s	″	s	″
Jan. 0.4	25.74 +.02	55.6 +1.5	9.85 +.01	64.4 −1.6	13.26 +.04	37.3 +0.5	48.77 −.02	62.0 +2.9
10.4	25.72 −.04	57.0 1.4	9.83 −.03	65.9 1.4	13.27 −.01	37.8 0.5	48.66 .19	64.9 2.7
20.4	25.65 .10	58.3 1.2	9.78 .08	67.2 1.2	13.23 .06	38.3 0.4	48.39 .34	67.5 2.5
30.4	25.52 .16	59.4 1.0	9.68 .11	68.3 1.0	13.15 .11	38.7 0.4	47.97 .49	69.8 2.1
Feb. 9.3	25.34 .20	60.3 0.7	9.55 .14	69.2 0.7	13.02 .15	39.0 0.3	47.42 .60	71.7 1.7
19.3	25.12 −.23	60.8 +0.4	9.39 −.17	69.8 −0.5	12.85 −.18	39.3 +0.2	46.76 −.69	73.1 +1.2
29.3	24.87 .26	61.2 +0.2	9.22 .18	70.2 −0.2	12.67 .19	39.4 +0.1	46.03 .75	74.0 0.6
Mar. 10.2	24.60 .26	61.1 −0.2	9.03 .19	70.3 0.0	12.46 .20	39.4 −0.1	45.26 .77	74.4 +0.1
20.2	24.34 .25	60.8 0.4	8.84 .18	70.1 +0.3	12.26 .20	39.2 0.2	44.49 .76	74.2 −0.4
30.2	24.10 .23	60.2 0.7	8.67 .17	69.7 0.5	12.07 .18	39.0 0.3	43.75 .71	73.5 0.9
Apr. 9.2	23.88 −.20	59.4 −0.9	8.51 −.14	69.1 +0.8	11.90 −.16	38.7 −0.3	43.07 −.63	72.3 −1.4
19.1	23.71 .15	58.4 1.1	8.38 .11	68.2 1.0	11.76 .12	38.3 0.4	42.49 .52	70.7 1.8
29.1	23.58 .10	57.2 1.2	8.29 .07	67.0 1.2	11.66 .08	37.9 0.4	42.03 .40	68.7 2.1
May 9.1	23.52 −.04	55.9 1.3	8.23 −.03	65.7 1.4	11.60 −.03	37.4 0.4	41.70 .25	66.5 2.4
19.1	23.51 +.02	54.6 1.3	8.22 +.01	64.2 1.6	11.59 +.02	37.0 0.4	41.52 −.10	64.0 2.5
29.0	23.56 +.09	53.3 −1.3	8.25 +.05	62.5 +1.8	11.63 +.06	36.7 −0.3	41.49 +.05	61.4 −2.6
June 8.0	23.68 .14	52.0 1.2	8.32 .09	60.6 1.9	11.72 .11	36.4 0.2	41.63 .21	58.8 2.6
18.0	23.85 .20	50.9 1.1	8.44 .13	58.6 2.0	11.86 .16	36.3 −0.1	41.91 .35	56.3 2.5
27.9	24.08 .25	49.9 0.9	8.59 .17	56.6 2.0	12.04 .20	36.2 0.0	42.33 .49	53.9 2.3
July 7.9	24.35 .30	49.1 0.7	8.77 .20	54.7 2.0	12.25 .23	36.3 +0.1	42.89 .61	51.7 2.1
17.9	24.67 +.33	48.5 −0.5	8.99 +.23	52.7 +1.9	12.50 +.26	36.4 +0.2	43.56 +.72	49.7 −1.8
27.9	25.02 .36	48.0 0.3	9.23 .25	50.9 1.7	12.78 .29	36.7 0.3	44.33 .82	48.1 1.5
Aug. 6.8	25.39 .38	47.8 −0.1	9.49 27	49.2 1.5	13.08 .30	37.0 0.3	45.19 .89	46.7 1.2
16.8	25.78 .39	47.8 +0.1	9.76 .28	47.8 1.3	13.39 .32	37.3 0.4	46.12 .95	45.8 0.8
26.8	26.18 .40	47.9 0.2	10.04 .28	46.7 1.0	13.71 .32	37.8 0.4	47.10 .99	45.2 −0.4
Sept. 5.8	26.58 +.41	48.3 +0.4	10.33 +.28	45.9 +0.6	14.04 +.33	38.2 +0.4	48.10 1.02	45.0 0.0
15.7	26.99 .40	48.8 0.6	10.61 .28	45.4 +0.3	14.37 .33	38.6 0.4	49.13 1.02	45.2 +0.4
25.7	27.39 .40	49.4 0.8	10.89 .27	45.3 −0.1	14.69 .32	39.0 0.4	50.15 1.01	45.7 0.8
Oct. 5.7	27.78 .38	50.3 0.9	11.16 .26	45.6 0.5	15.01 .31	39.5 0.4	51.15 .98	46.7 1.2
15.6	28.16 .36	51.3 1.0	11.42 .25	46.3 0.8	15.32 .30	39.9 0.4	52.11 .93	48.1 1.6
25.6	28.51 +.34	52.4 +1.2	11.66 +.23	47.2 −1.1	15.01 +.28	40.2 +0.4	53.02 +.87	49.9 +1.9
Nov. 4.6	28.84 .31	53.6 1.3	11.88 .21	48.5 1.4	15.89 .27	40.6 0.4	53.85 .78	51.9 2.2
14.6	29.13 .27	55.0 1.4	12.08 .18	50.0 1.5	16.14 .23	41.0 0.4	54.58 .67	54.3 2.5
24.5	29.38 .24	56.4 1.5	12.25 .15	51.6 1.7	16.36 .20	41.4 0.4	55.19 .55	57.0 2.7
Dec. 4.5	29.59 .18	58.0 1.5	12.39 .12	53.3 1.7	16.54 .16	41.9 0.5	55.67 .41	59.8 2.9
14.5	29.74 +.12	59.5 +1.6	12.49 +.08	55.0 −1.7	16.68 +.12	42.4 +0.5	56.01 +.25	62.8 +3.0
24.5	29.83 +.06	61.1 1.5	12.55 +.04	56.7 1.6	16.77 .07	42.8 0.5	56.18 +.09	65.8 3.0
34.4	29.86 .00	62.6 +1.4	12.56 .00	58.2 −1.5	16.82 +.03	43.4 +0.5	56.18 −.07	68.7 +2.8

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	δ Orionis.		α Leporis.		ε Orionis.		α Columbæ.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*
	h m 5 26	° ′ — 0 22	h m 5 27	° —17 54	h m 5 30	° — 1 16	h m 5 35	° —34 7
	s	″	s	″	s	″	s	″
Jan. 0.4	17.60 +.03	66.9 −1.2	48.10 +.01	21.7 −2.1	32.34 +.03	35.9 −1.3	36.67 .00	75.2 −2.9
10.4	17.61 −.01	68.1 1.1	48.09 −.03	23.7 1.9	32.35 −.01	37.1 1.1	36.64 −.06	77.8 2.5
20.4	17.58 .06	69.1 0.9	48.04 .07	25.5 1.6	32.32 .05	38.2 1.0	36.56 .10	80.2 2.2
30.4	17.50 .10	70.0 0.8	47.95 .11	27.0 1.4	32.24 .09	39.1 0.8	36.43 .15	82.2 1.8
Feb. 9.3	17.38 .13	70.6 0.6	47.81 .15	28.2 1.1	32.13 .13	39.8 0.6	36.26 .19	83.9 1.4
19.3	17.24 −.16	71.1 −0.4	47.65 −.18	29.1 −0.7	31.99 −.16	40.3 −0.4	36.06 −.22	85.1 −1.0
29.3	17.07 .17	71.5 −0.2	47.46 .19	29.7 −0.4	31.82 .17	40.7 0.2	35.83 .24	85.9 0.6
Mar. 10.3	16.89 .18	71.6 0.0	47.26 .20	29.9 0.0	31.64 .18	40.8 −0.1	35.58 .24	86.2 −0.1
20.2	16.71 .18	71.5 +0.1	47.06 .20	29.8 +0.3	31.46 .18	40.8 +0.1	35.34 .24	86.1 +0.3
30.2	16.53 .17	71.3 0.3	46.86 .18	29.3 0.6	31.28 .17	40.5 0.3	35.10 .23	85.5 0.8
Apr. 9.2	16.37 −.15	70.9 +0.5	46.69 −.16	28.5 +0.9	31.12 −.15	40.1 +0.5	34.87 −.21	84.5 +1.2
19.2	16.24 .12	70.3 0.7	46.53 .14	27.4 1.2	30.98 .12	39.5 0.7	34.68 .18	83.1 1.6
29.1	16.14 .08	69.5 0.9	46.41 .10	26.0 1.5	30.88 .09	38.7 0.9	34.51 .14	81.3 1.9
May 9.1	16.08 −.04	68.6 1.0	46.33 .06	24.4 1.8	30.81 −.05	37.7 1.1	34.39 .10	79.2 2.3
19.1	16.06 .00	67.5 1.2	46.29 −.02	22.5 2.0	30.79 .00	36.6 1.2	34.31 −.05	76.8 2.5
29.0	16.08 +.04	66.2 +1.3	46.29 +.03	20.4 +2.2	30.81 +.04	35.3 +1.4	34.28 .00	74.1 +2.7
June 8.0	16.14 .09	64.9 1.4	46.34 .07	18.1 2.3	30.86 .08	33.9 1.5	34.30 +.04	71.3 2.9
18.0	16.25 .13	63.4 1.5	46.43 .11	15.8 2.4	30.97 .12	32.3 1.6	34.37 .09	68.3 3.0
28.0	16.39 .16	61.8 1.6	46.56 .15	13.4 2.4	31.10 .15	30.7 1.6	34.48 .13	65.3 3.0
July 7.9	16.57 .19	60 2 1.6	46.73 .18	11.0 2.3	31.28 .19	29.1 1.6	34.63 .17	62.4 2 9
17.9	16.78 +.22	58.7 +1.5	46.93 +.21	8.7 +2.2	31.48 +.21	27.5 +1.5	34.82 +.21	59.5 +2.7
27.9	17.00 .24	57.2 1.4	47.15 .24	6.5 2.0	31.71 .24	26.0 1.5	35.05 .24	56.9 2.5
Aug. 6.8	17.25 .26	55.8 1.3	47.40 .26	4.6 1.8	31.95 .25	24.6 1.3	35.31 .27	54.5 2.2
16.8	17.52 .27	54.6 1.1	47.67 .27	2.9 1.5	32.22 .27	23.4 1.1	35.59 .29	52.6 1.8
26.8	17.80 .28	53.6 0.9	47.95 .28	1.6 1.1	32.49 .28	22.4 0.9	35.89 .30	51.0 1.3
Sept. 5.8	18.08 +.28	52.9 +0.6	48.23 +.29	0.7 +0.7	32.77 +.28	21.6 +0.6	36.20 +.31	50.0 +0.8
15.7	18.36 .28	52.4 +0.3	48.52 .29	0.3 +0.2	33.05 .28	21.2 +0.3	36.52 .32	49.4 +0.3
25.7	18.65 .28	52.3 0.0	48.81 .28	0.2 −0.2	33.34 .28	21.1 0.0	36.83 .31	49.5 −0.3
Oct. 5.7	18.92 .27	52.4 −0.3	49.09 .28	0.7 0.6	33.62 .27	21.2 −0.3	37.14 .31	50.0 0.9
15.7	19.19 .26	52.8 0.6	49.36 .27	1.5 1.1	33 89 .26	21.7 0.6	37.44 .29	51.2 1.4
25.6	19.45 +.25	53.5 −0.8	49.62 +.25	2.8 −1.4	34.15 +.25	22.4 −0.9	37.73 +.27	52.8 −1.9
Nov. 4.6	19.69 .23	54.5 1.0	49.86 .22	4.4 1.8	34.39 .23	23.4 1.1	37.99 .24	54.9 2.3
14.6	19.90 .20	55.6 1.2	50.07 .20	6.3 2.0	34.61 .21	24.6 1.2	38.21 .21	57.4 2.6
24.5	20.09 .17	56.8 1.3	50.25 .17	8.4 2.2	34.80 .18	25.9 1.3	38.41 .17	60.1 2.8
Dec. 4.5	20.25 .14	58.1 1.3	50.40 .13	10.6 2.2	34.96 .14	27.3 1.4	38.56 .13	63.0 2.9
14.5	20.37 +.10	59.5 −1.3	50.51 +.09	12.9 −2.2	35.09 +.11	28.7 −1.4	38.66 +.08	65.9 −2.9
24.5	20.46 .06	60.7 1.2	50.58 +.04	15.1 2.1	35.17 .06	30.0 1.3	38.72 +.03	68.8 2 8
34.4	20.50 +.02	61.9 −1.1	50.60 .00	17.1 −1.9	35.21 +.02	31.3 −1.2	38.72 −.02	71.5 −2.7

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Orionis.		ν Orionis.		22 Camelop. (H.)		μ Geminorum.	
	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.
	h m 5 49	° ′ + 7 22	h m 6 1	° +14 46	h m 6 6	° +69 21	h m 6 16	° +22 34
	s	″	s	″	s	″	s	″
Jan. 0.5	7.01 +.09	59.5 −0.8	11.21 +.07	44.3 0.4	32.09 +.12	22.6 +2.7	11.65 +.09	5.6 0.0
10.4	7.05 +.02	58.7 0.7	11.26 +.02	43.9 0.3	32.15 −.01	25.3 2.6	11.72 +.04	5.6 +0.1
20.4	7.04 −.03	58.1 0.6	11.26 −.02	43.6 0.2	32.08 .13	27.8 2.5	11.73 −.01	5.8 0.2
30.4	6.98 .08	57.5 0.5	11.22 .07	43.4 0.2	31.88 .25	30.2 2.2	11.70 .06	6.0 0.2
Feb. 9.4	6.88 .11	57.1 0.4	11.13 .11	43.3 −0.1	31.58 .35	32.3 1.9	11.62 .10	6.3 0.3
19.3	6.75 −.15	56.8 −0.2	11.00 −.14	43.3 0.0	31.18 −.44	34.1 +1.6	11.50 −.14	6.5 +0.2
29.3	6.59 .17	56.6 −0.1	10.84 .17	43.3 0.0	30.70 .50	35.5 1.1	11.34 .17	6.8 0.2
Mar. 10.3	6.41 .18	56.6 0.0	10.67 .18	43.3 0.0	30.17 .54	36.3 0.6	11.16 .18	7.0 0.2
20.3	6.23 .18	56.5 +0.1	10.48 .18	43.4 +0.1	29.62 .55	36.7 +0.1	10.97 .19	7.1 0.1
30.2	6.05 .17	56.7 0.2	10.30 .18	43.4 0.1	29.07 .54	36.5 −0.4	10.78 .19	7.2 +0.1
Apr. 9.2	5.89 −.15	56.9 +0.3	10.13 −.16	43.6 +0.1	28.55 −.50	35.9 −0.8	10.60 −.17	7.3 0.0
19.2	5.75 .13	57.2 0.4	9.98 .13	43.7 0.2	28.08 .43	34.8 1.3	10.44 .15	7.3 0.0
29.1	5.63 .09	57.7 0.5	9.86 .10	43.9 0.2	27.68 .35	33.4 1.6	10.31 .11	7.3 0.0
May 9.1	5.56 .06	58.2 0.6	9.78 .06	44.2 0.3	27.37 .26	31.6 1.9	10.21 .08	7.2 0.0
19.1	5.52 −.01	58.9 0.7	9.74 −.02	44.5 0.3	27.17 .15	29.5 2.2	10.15 −.03	7.2 0.0
29.1	5.53 +.03	59.7 +0.8	9.74 +.02	44.9 +0.4	27.07 −.04	27.2 −2.3	10.14 +.01	7.2 0.0
June 8.0	5.58 .07	60.6 0.9	9.78 .06	45.3 0.5	27.08 +.07	24.9 2.4	10.17 .05	7.2 0.0
18.0	5.67 .11	61.6 1.0	9.85 .10	45.9 0.6	27.21 .18	22.5 2.4	10.25 .10	7.2 +0.1
28.0	5.80 .15	62.7 1.1	9.99 .15	46.5 0.6	27.44 .29	20.1 2.3	10.37 .14	7.3 0.1
July 8.0	5.96 .18	63.8 1.1	10.15 .18	47.1 0.7	27.78 .38	17.9 2.2	10.52 .17	7.4 0.2
17.9	6.16 +.21	64.9 +1.1	10.34 +.21	47.8 +0.7	28.20 +.47	15.7 −2.0	10.71 +.20	7.6 +0.2
27.9	6.38 .23	66.0 1.0	10.56 .23	48.4 0.6	28.72 .55	13.8 1.8	10.93 .23	7.8 0.2
Aug 6.9	6.62 .25	67.0 1.0	10.80 .25	49.1 0.6	29.30 .61	12.1 1.6	11.17 .26	8.0 0.2
16.8	6.88 .27	67.9 0.8	11.06 .27	49.6 0.5	29.95 .67	10.7 1.3	11.44 .28	8.2 0.2
26.8	7.16 .28	68.6 0.7	11.34 .28	50.1 0.4	30.64 .71	9.6 0.9	11.72 .29	8.3 0.1
Sept. 5.8	7.43 +.28	69.2 +0.5	11.63 +.29	50.5 +0.3	31.37 +.75	8.8 −0.6	12.02 +.30	8.4 +0.1
15.8	7.72 .29	69.6 +0.2	11.92 .30	50.8 +0.2	32.13 .76	8.4 −0.2	12.33 .31	8.4 0.0
25.7	8.01 .29	69.7 0.0	12.22 .30	50.8 0.0	32.90 .77	8.4 +0.2	12.64 .31	8.4 −0.1
Oct. 5.7	8.30 .29	69.6 −0.2	12.52 .29	50.8 −0.1	33.67 .77	8.7 0.5	12.96 .32	8.3 0.1
15.7	8.59 .28	69.3 0.4	12.82 .29	50.6 0.3	34.44 .75	9.3 0.8	13.27 .31	8.1 0.2
25.7	8.86 +.27	68.8 −0.6	13.11 +.28	50.2 −0.4	35.18 +.72	10.3 +1.2	13.58 +.30	7.9 −0.2
Nov. 4.6	9.12 .25	68.1 0.7	13.38 .27	49.8 0.5	35.87 .67	11.7 1.6	13.88 .29	7.6 0.3
14.6	9.36 .23	67.3 0.8	13.64 .25	49.2 0.5	36.52 .61	13.5 1.9	14.16 .27	7.4 0.3
24.6	9.58 .20	66.4 0.9	13.88 .22	48.7 0.6	37.09 .53	15.5 2.2	14.42 .25	7.1 0.2
Dec. 4.5	9.76 .17	65.5 0.9	14.08 .19	48.1 0.5	37.57 .43	17.8 2.4	14.65 .21	6.9 0.2
14.5	9.91 +.13	64.5 −0.9	14.25 +.15	47.6 −0.5	37.96 +.33	20.3 +2.6	14.85 +.17	6.8 −0.1
24.5	10.02 .09	63.6 0.9	14.38 .11	47.1 0.4	38.23 .21	22.9 2.7	15.00 .13	6.8 0.0
34.5	10.09 +.04	62.8 −0.8	14.46 +.06	46.7 −0.3	38.37 +.08	25.6 +2.8	15.10 +.08	6.8 +0.1

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Argus. (*Canopus.*)		γ Geminorum.		α Canis Majoris. (*Sirius.*)		ε Canis Majoris.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*
	h m 6 21	° ′ −52 37	h m 6 31	° ′ +16 29	h m 6 40	° ′ −16 33	h m 6 54	° ′ −28 49
	s	″	s	″	s	″	s	″
Jan. 0.5	29.98 +.01	73.0 −3.3	15.03 +.11	31.4 −0.4	13.60 +.09	55.2 −2.4	14.48 +.08	18.9 −2 9
10.5	29.95 −.07	76.4 3.2	15.11 .06	31.1 0.3	13.66 +.04	57.5 2.2	14.54 +.04	21.7 2.7
20.4	29.85 .13	79.5 3.0	15.14 +.01	30.8 0.2	13 67 −.02	59.5 2.0	14.56 −.01	24.4 2.5
30.4	29.68 .20	82.3 2.6	15.12 −.04	30.7 −0.1	13.63 .06	61.4 1.7	14.51 .07	26.8 2 3
Feb. 9.4	29.45 .25	84.7 2.2	15.06 .09	30.7 0.0	13.55 .10	63.0 1.4	14.42 .11	28.9 1.9
19.4	29.18 −.30	86.7 −1.7	14.95 −.13	30.8 +0.1	13.43 −.14	64.3 −1.1	14.28 −.15	30.7 −1.6
29.3	28.86 .33	88.2 1.2	14.80 .15	30.9 0.1	13.28 .17	65.3 0.8	14.11 .19	32.1 1.2
Mar. 10.3	28.51 .35	89.1 0.7	14.64 .17	31.0 0.2	13.10 .19	65.9 0.5	13.91 .21	33.1 0 8
20.3	28.15 .36	89.6 −0.1	14.45 .18	31.2 0.2	12.90 .20	66.3 −0.2	13.69 .22	33.6 −0 4
30.3	27.79 .36	89.5 +0.3	14.27 .18	31.3 0.2	12.71 .20	66.3 +0.2	13.47 .22	33.8 0.0
Apr. 9.2	27.43 −.34	88.9 +0.8	14.09 −.17	31.5 +0.2	12.52 −.19	65.9 +0.5	13.25 −.21	33.6 +0.4
19.2	27.10 .31	87.8 1.5	13.93 .15	31 7 0.2	12.34 .17	65.3 0.8	13.04 .20	32.9 0.8
29.2	26.81 .28	86.2 1.8	13.80 .12	31.9 0.2	12.18 .14	64.4 1.1	12.85 .17	31.9 1.2
May 9.1	26.55 .23	84.2 2.2	13.69 .08	32.1 0.2	12.06 .11	63.2 1.3	12.69 .14	30.5 1.5
19.1	26.34 .18	81.8 2.6	13.63 −.04	32.3 0.3	11.96 .07	61.8 1.6	12.56 .11	28.8 1.9
29.1	26.19 −.12	79.1 +2.9	13.60 .00	32.6 +0.3	11.90 −.04	60.1 +1.8	12.48 −.07	26.8 +2.1
June 8.1	26.10 −.06	76.1 3.1	13.62 +.04	32.9 0.4	11.89 .00	58.2 1.9	12.43 −.03	24.6 2.3
18.0	26.07 .00	72.9 3.3	13.68 .08	33.3 0.4	11.92 +.04	56.2 2.1	12.42 +.01	22.1 2.5
28.0	26.09 +.06	69.6 3.3	13.78 .11	33.7 0.4	11.98 .08	54.1 2.1	12.45 .05	19.5 2.6
July 8.0	26.18 .12	66.3 3.3	13.91 .15	34.1 0.4	12.08 .11	51.9 2.1	12.53 .09	16.9 2 6
18.0	26.33 +.17	63.0 +3.2	14.08 .18	34.6 +0.4	12.21 +.15	49.8 +2.1	12.64 +.13	14.2 +2 6
27.9	26.53 .23	59.9 3.0	14.28 .21	35.0 0.4	12.37 .18	47 7 2.0	12 79 .16	11.7 2.5
Aug. 6.9	26.78 .27	57.0 2.7	14.50 .23	35.5 0.4	12.57 .21	45.8 1.8	12.97 .20	9.3 2.2
16 9	27.08 .31	54.5 2.3	14.75 .25	35.8 0.3	12.78 .23	44.2 1.5	13.18 .23	7.2 2.0
26.8	27.41 .35	52.4 1.8	15.01 .27	36.1 0.2	13.02 .25	42.8 1.2	13.42 .25	5.4 1.6
Sept. 5.8	27.78 +.38	50.8 +1.3	15.29 +.28	36.2 +0.1	13.28 +.27	41.8 +0.8	13.69 +.27	4.0 +1.2
15.8	28.17 .39	49.8 0.7	15.58 .29	36.3 0.0	13.55 .28	41.1 +0.4	13.97 .29	3.0 0.7
25.8	28.57 .40	49.5 +0.1	15.88 .30	36.2 −0 2	13.84 .29	40.9 0.0	14.26 .30	2.6 +0.2
Oct. 5.7	28.98 .40	49.7 −0.6	16.18 .31	36.0 0.3	14.13 .29	41.1 −0.5	14.57 .31	2.7 −0.3
15.7	29.38 .39	50.6 1.2	16.49 .30	35.6 0.4	14.42 .29	41.8 0.9	14.88 .31	3.3 0.9
25.7	29.76 +.37	52.2 −1.8	16.79 +.30	35.1 −0.5	14.70 +.28	43.0 −1.3	15.19 +.30	4.4 −1.4
Nov. 4.7	30.12 .34	54.2 2.3	17.09 .29	34.6 0.6	14.99 .27	44.4 1.7	15.49 .29	6.0 1.8
14.6	30.44 .30	56.8 2.8	17.37 .27	34.0 0.6	15.25 .25	46.2 2.0	15.78 .27	8.1 2.2
24.6	30.72 .25	59.8 3.1	17.63 .25	33.3 0 6	15.49 .23	48.3 2.2	16.04 .25	10.5 2.5
Dec. 4.6	30.94 .19	63.1 3.3	17.86 .22	32.7 0.6	15.71 .20	50.6 2.3	16.27 .21	13.2 2.8
14.5	31.10 +.12	66.5 −3.5	18.06 +.18	32.2 −0.5	15.89 +.16	53.0 −2.4	16.46 +.17	16.0 −2 9
24.5	31.19 +.05	70.0 3.5	18.22 .14	31.7 0.4	16.03 .12	55.4 2.4	16.61 .12	18.9 2 9
34.5	31.21 −.02	73.4 −3.3	18.34 +.09	31.3 −0.3	16.13 +.07	57.7 −2.2	16.71 +.07	21.8 −2.8

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	δ Canis Majoris.		δ Geminorum.		Piazzi vii. 67.		a^2 Geminorum. (*Castor.*)	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 7 3	° ′ −26 12	h m 7 13	° ′ +22 11	h m 7 19	° ′ +68 41	h m 7 27	° ′ +32 7
	s	″	s	″	s	″	s	″
Jan. 0.5	51.19 +.08	62.3 −2.8	26.53 +.15	8.5 −0.1	15.10 + 32	26.6 +2.4	27.75 +.18	52.4 +0.4
10.5	51.26 +.04	65.0 2.7	26.66 .10	8.4 0.0	15.36 .19	29.1 2.6	27.90 .13	52.9 0.6
20.5	51.29 .00	67.6 2.5	26.73 +.05	8.5 +0.1	15.48 +.06	31.7 2.6	28.00 .07	53.6 0.7
30.4	51.26 −.05	70.0 2.2	26.76 .00	8.6 0.2	15.48 −.07	34.4 2.6	28.04 +.01	54.4 0.8
Feb. 9.4	51.18 .10	72.1 1.9	26.73 −.05	8 9 0.3	15.35 .18	36.9 2.4	28.02 −.05	55.2 0.9
19.4	51 06 −.14	73.8 −1.6	26.65 −.10	9.3 +0.4	15.11 −.29	39.3 +2.2	27.95 −.10	56.1 +0.9
29.4	50.90 .17	75.2 1.2	26.53 .14	9.7 0.4	14.77 .38	41.3 1.9	27.83 .14	57.0 0.8
Mar. 10.3	50.71 .20	76.2 0.8	26.38 .16	10.1 0.4	14.35 .45	43.0 1.5	27.67 .17	57.8 0.7
20.3	50.51 .21	76.9 −0.4	26.20 .18	10 5 0.4	13.86 .50	44.3 1.0	27.49 .19	58.5 0.6
30.3	50.29 .21	77.1 0.0	26.02 .19	10.9 0.3	13.35 .52	45.1 +0.5	27.29 .20	59.0 0.5
Apr. 9.2	50.08 −.21	76.9 +0.3	25.83 −.18	11.2 +0.3	12.83 −.51	45.3 0.0	27.08 −.20	59.4 +0.3
19.2	49.87 .19	76.4 0.7	25.66 .17	11.4 0.2	12.32 .49	45.1 −0.4	26.89 .18	59.6 +0.1
29.2	49.69 .17	75.4 1.1	25.50 .14	11.6 0.2	11.85 .44	44.5 0.9	26.71 .16	59.7 0.0
May 9.2	49.53 .14	74.2 1.4	25.38 .11	11.7 0.1	11.45 .37	43.4 1.3	26.57 .13	59.6 −0.2
19.1	49.41 .11	72.6 1.7	25.28 .08	11.8 +0.1	11.11 .29	41.9 1.6	26.45 .10	59.4 0.3
29.1	49.32 −.07	70.7 +2.1	25.22 −.04	11.9 0.0	10.87 −.20	40.1 −2.0	26.37 −.06	59.0 −0.5
June 8.1	49.26 −.03	68.6 2.2	25.21 .00	11.9 0.0	10.72 −.10	38.0 2.2	26.34 −.01	58.6 0.5
18.1	49.25 +.01	66.3 2.4	25.22 +.04	11.9 0.0	10.67 .00	35.7 2.4	26.35 +.03	58.0 0.6
28.0	49.28 .05	63.8 2.5	25.29 .08	11.9 0.0	10.72 +.10	33.3 2.5	26.40 .07	57.4 0.6
July 8 0	49.35 .09	61.3 2.5	25.38 .12	11.8 0.0	10.87 .20	30.8 2.5	26.49 .11	56.8 0.6
18.0	49.45 +.12	58.8 +2.5	25.52 +.15	11.8 0.0	11.11 +.30	28.3 −2.5	26.62 +.15	56.1 −0.7
28.0	49.59 .16	56.3 2.4	25.68 .18	11.7 −0.1	11.44 .38	25.8 2.4	26 78 .18	55.5 0.7
Aug. 6.9	49.77 .19	54.0 2.2	25.88 .21	11.6 0.1	11.86 .46	23.5 2.3	26.98 .21	54.8 0.7
16.9	49 97 .22	52.0 1.9	26.10 .23	11.5 0.1	12.36 .53	21.3 2.1	27.21 .24	54.0 0.7
26.9	50 20 .24	50.2 1.6	26.35 .26	11.3 0.2	12.92 .59	19.3 1.9	27.47 .27	53.3 0.7
Sept. 5.8	50.45 +.26	48.8 +1.2	26.61 +.28	11.0 −0.3	13.54 +.64	17.5 −1.6	27.75 +.29	52.6 −0.7
15.8	50 73 .28	47.9 0.7	26.90 .29	10.7 0.4	14.21 .69	16.0 1.3	28.05 .31	51.8 0.8
25.8	51 01 .29	47.5 +0.2	27.20 .31	10.2 0.5	14.92 .72	14.8 1.0	28.37 .33	51.1 0.7
Oct. 5.8	51.31 .30	47.5 −0.3	27.51 .31	9.7 0.6	15.66 .75	14.0 0.7	28.70 .34	50.3 0.7
15.7	51.62 .31	48.1 0.8	27.83 .32	9.1 0 6	16.42 .76	13.5 −0.3	29.05 .35	49.6 0.7
25.7	51.93 +.30	49.2 −1.4	28.15 +.32	8.5 −0.7	17.18 +.76	13.4 +0.1	29.40 +.35	48.9 −0.6
Nov. 4.7	52.23 .29	50.7 1.8	28.47 .32	7.8 0.7	17.93 .74	13.7 0 5	29.76 .35	48.4 0.5
14.6	52.52 .28	52.7 2.1	28.79 .31	7.1 0.6	18 66 .71	14.5 0.9	30.11 .34	47.9 0.4
24.6	52.78 .25	55.0 2.4	29.09 .29	6.5 0.6	19 35 .65	15.6 1.3	30.44 .32	47.6 0.2
Dec. 4.6	53.02 .22	57.6 2.7	29.37 .26	5.9 0.5	19.97 .58	17.1 1.7	30.75 .30	47.4 −0.1
14.6	53.22 +.18	60.3 −2.8	29.61 +.23	5.5 −0.4	20.52 +.49	19.0 +2.0	31.03 +.26	47.4 +0.1
24.5	53.38 .14	63.1 2 8	29.82 .19	5.2 0.3	20.96 .39	21.2 2.3	31.27 .22	47.6 0.3
34 5	53 49 +.09	66 0 −2.8	29.99 +.14	5.0 −0.1	21.30 +.28	23.6 +2.5	31.47 +.16	48.0 +0.5

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Canis Minoris. (*Procyon.*)		β Geminorum. (*Pollux.*)		φ Geminorum.		3 Ursæ Majoris (H.)	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 7 33	° ′ + 5 30	h m 7 38	° ′ +28 17	h m 7 46	° ′ +27 3	h m 8 1	° ′ +68 47
	s	″	s	″	s	″	s	″
Jan. 0.5	26.86 +.16	35.7 −1.3	28.19 +.18	37.6 +0.1	38.99 +.19	10.2 0.0	41.14 +.43	58.4 +2.2
10.5	27.00 .11	34.5 1.1	28.35 .13	37.8 0.3	39.16 .14	10.3 +0.2	41.51 .30	60.7 2.4
20.5	27.08 .06	33.5 0.8	28.45 .08	38.2 0.5	39.28 .09	10.6 0.4	41.75 .18	63.3 2.6
30.5	27.11 +.01	32.6 0.6	28.50 +.02	38.7 0.6	39.33 +.03	11.0 0.5	41.86 +.05	66.0 2.7
Feb. 9.4	27.09 −.04	31.9 0.4	28.50 −.03	39.4 0.7	39.34 −.02	11.6 0.6	41.84 −.08	68.6 2.6
19.4	27.03 −.08	31.4 −0.2	28.44 −.08	40.1 +0.7	39.29 −.07	12.3 +0.7	41.70 −.20	71.2 +2.5
29.4	26.92 .12	31.1 −0.1	28.33 .13	40.8 0.7	39.19 .12	13.0 0.7	41.44 .30	73.6 2.2
Mar. 10.4	26.79 .15	30.9 0.0	28.18 .16	41.5 0.7	39.05 .15	13 7 0.7	41.09 .39	75.7 1.9
20.3	26.63 .16	30.9 +0.2	28.01 .18	42.2 0.6	38.89 .17	14.3 0.6	40.66 .45	77.4 1.5
30.3	26.46 .17	31.0 0.3	27.82 .19	42.7 0.5	38.71 .18	14.9 0.5	40.18 .49	78.7 1.0
Apr. 9.3	26.29 −.17	31.2 +0.4	27.63 −.19	43.2 +0.4	38.52 −.19	15.4 +0.4	39.67 −.51	79.5 +0.6
19.2	26.13 .16	31.6 0.5	27.44 .18	43.5 0.2	38.33 .18	15.8 0.3	39.16 .50	79.9 +0.1
29.2	25.97 .14	32.0 0.6	27.27 .16	43.7 +0.1	38.17 .16	16.0 0.2	38.67 .47	79.7 −0.4
May 9.2	25.84 .12	32.5 0.6	27.12 .13	43.8 0.0	38.02 .13	16.1 +0.1	38.22 .42	79.1 0.8
19.2	25.74 .09	33.2 0.7	27.01 .10	43.7 −0.1	37.90 .10	16.2 0.0	37.82 .36	78.0 1.3
29.1	25.67 −.05	33.8 +0.8	26.93 −.06	43.5 −0.2	37.82 −.07	16.1 −0.1	37.50 −.28	76.5 −1.6
June 8.1	25.63 −.02	34.6 0.8	26.89 −.02	43.3 0.3	37.77 −.03	15.9 0.2	37.26 .19	74.7 2.0
18.1	25.63 +.01	35.4 0.9	26.88 +.02	43.0 0.4	37.76 +.01	15.6 0.3	37.11 .10	72.6 2.2
28.0	25.66 .04	36.2 0.9	26.92 .06	42.6 0.4	37.79 .05	15.3 0.3	37.05 −.01	70.2 2.4
July 8.0	25.73 .08	37.1 0.8	27.00 .09	42.1 0.5	37.86 .09	14.9 0.4	37.10 +.09	67.7 2.6
18.0	25.83 +.11	37.9 +0.8	27.11 +.13	41.7 −0.5	37.97 +.12	14.5 −0.4	37.23 +.18	65.1 −2.6
28.0	25.96 .14	38.7 0.7	27.26 .16	41.2 0.5	38.10 .15	14.1 0.5	37.45 .27	62.5 2.6
Aug. 6.9	26.12 .17	39.4 0.5	27.44 .19	40.6 0.6	38.28 .19	13.5 0.5	37.77 .36	59.8 2.6
16.9	26.29 .20	40.1 0.3	27.65 .22	40.0 0.6	38.47 .21	13.0 0.6	38.17 .44	57.3 2.5
26.9	26.51 .22	40.5 +0.1	27.88 .25	39.4 0.7	38.70 .24	12.4 0.7	38.64 .51	54.8 2.4
Sept. 5.9	26.73 +.24	40.8 −0.1	28.14 +.27	38.7 −0.7	38.95 +.26	11.7 −0.7	39.19 +.57	52.6 −2.2
15.8	26.99 .26	40.8 0.3	28.43 .29	38.0 0.7	39.23 .29	10.9 0.8	39.79 .63	50.5 1.9
25.8	27.26 .27	40.6 0.6	28.73 .31	37.2 0.8	39.53 .31	10.1 0.8	40.45 .68	48.7 1.6
Oct. 5.8	27.53 .29	40.1 0.8	29.05 .33	36.4 0.8	39.84 .32	9.3 0.9	41.16 .72	47.3 1.3
15.8	27.83 .30	39.4 1.0	29.38 .34	35.6 0.8	40.17 .33	8.4 0.9	41.90 .75	46.1 0.9
25.7	28.13 +.30	38.5 −1.2	29.72 +.34	34.8 −0.8	40.50 +.34	7.6 −0.9	42.66 +.77	45.4 −0.6
Nov. 4.7	28.43 .30	37.4 1.3	30.06 .34	34.1 0.7	40.85 .34	6.7 0.8	43.43 .77	45.0 −0.1
14.7	28.73 .29	36.1 1.4	30.40 .34	33.4 0.6	41.19 .34	5.9 0.7	44.19 .75	45.1 +0.3
24.6	29.02 .27	34.7 1.4	30.73 .32	32.8 0.5	41.52 .32	5.2 0.6	44.93 .71	45.7 0.8
Dec. 4.6	29.28 .25	33.3 1.4	31.04 .30	32.4 0.4	41.83 .30	4.7 0.5	45.62 .66	46.6 1.2
14.6	29.52 +.22	31.8 −1.4	31.32 +.26	32.1 −0.2	42.12 +.27	4.3 −0.3	46.25 +.58	48.1 +1.6
24.6	29.73 .18	30.4 1.3	31.56 .22	32.0 0.0	42.36 .23	4.1 −0.1	46.79 .49	49.9 2.0
34.5	29.89 +.14	29.1 −1.2	31.76 +.17	32.2 +0.2	42.57 +.18	4.1 +0.1	47.23 +.38	52.1 +2.3

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	15 Argus (ι)		η Cancri.		ε Hydræ.		ι Ursæ Majoris.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 8 2	° ′ −23 58	h m 8 26	° ′ +20 48	h m 8 40	° ′ + 6 49	h m 8 51	° ′ +48 28
	s	″	s	″	s	″	s	″
Jan. 0.6	47.30 +.19	56.4 −2.8	14.25 +.22	68.5 −0.6	51.04 +.22	40.4 −1.4	32.52 +.33	39.8 +0.8
10.6	47.44 .12	59.1 2.7	14.45 .18	68.1 0.3	51.24 .17	39.1 1.2	32.82 .26	40.8 1.1
20.5	47.53 .06	61.8 2.6	14.61 .12	67.8 −0.1	51.39 .13	37.9 1.0	33.05 .19	42.1 1.4
30.5	47.57 +.01	64.4 2.4	14.70 .07	67.8 +0.1	51.49 .07	37.0 0.8	33.21 .12	43.6 1.7
Feb. 9.5	47.55 −.04	66.6 2.1	14.74 +.02	68.0 0.2	51.54 +.02	36.3 0.6	33.29 +.05	45.4 1.8
19.4	47.49 −.09	68.7 −1.8	14.73 −.03	68.3 +0.4	51.54 −.02	35.8 −0.4	33.30 −.02	47.3 +1.9
29.4	47.38 .13	70.3 1.5	14.67 .08	68.8 0.5	51.50 .06	35.5 −0.2	33.25 .09	49.2 1.9
Mar. 10.4	47.24 .16	71.7 1.2	14.58 .12	69.3 0.6	51.41 .10	35.4 0.0	33.13 .14	51.0 1.8
20.4	47.07 .18	72.7 0.8	14.44 .14	69.9 0.6	51.29 .13	35.4 +0.1	32.96 .19	52.7 1.6
30.3	46.88 .19	73.3 0.4	14.29 .16	70.5 0.6	51.15 .15	35.6 0.2	32.75 .22	54.2 1.3
Apr. 9.3	46.68 −.19	73.6 −0.1	14.12 −.17	71.1 +0.6	51.00 −.15	35.9 +0.3	32.52 −.24	55.4 +1.1
19.3	46.49 .19	73.5 +0.3	13.95 .17	71.7 0.5	50.84 .15	36.3 0.4	32.27 .25	56.3 0.8
29.2	46.30 .18	73.0 0.6	13.79 .16	72.1 0.4	50.69 .15	36.8 0.5	32.02 .24	56.9 +0.4
May 9.2	46.13 .16	72.2 1.0	13.64 .14	72.5 0.3	50.55 .13	37.3 0.6	31.79 .22	57.1 0.0
19.2	45.98 .13	71.1 1.3	13.51 .11	72.8 0.3	50.42 .11	37.9 0.6	31.58 .20	57.0 −0.3
29.2	45.86 −.10	69.7 +1.5	13.41 −.09	73.0 +0.2	50.32 −.09	38.5 +0.6	31.40 −.16	56.5 −0.6
June 8.1	45.77 .07	68.0 1.8	13.34 .05	73.2 +0.1	50.24 .06	39.2 0.7	31.25 .12	55.8 0.9
18.1	45.72 −.04	66.1 2.0	13.30 −.02	73.3 0.0	50.19 −.03	39.8 0.7	31.15 .08	54.7 1.2
28.1	45.70 .00	64.0 2.1	13.30 +.01	73.3 0.0	50.17 .00	40.5 0.7	31.10 −.04	53.4 1.4
July 8.1	45.71 +.03	61.8 2.2	13.33 .04	73.3 −0.1	50.18 +.03	41.2 0.7	31.08 +.01	51.9 1.6
18.0	45.76 +.06	59.5 +2.3	13.39 +.08	73.1 −0.2	50.22 +.05	41.8 +0.6	31.12 +.06	50.3 −1.8
28.0	45.84 .10	57.3 2.2	13.48 .11	72.9 0.3	50.29 .08	42.4 0.5	31.20 .10	48.4 1.9
Aug. 7.0	45.95 .13	55.1 2.1	13.60 .14	72.6 0.3	50.39 .11	42.9 0.4	31.32 .15	46.5 2.0
16.9	46.10 .16	53.1 1.9	13.76 .17	72.2 0.4	50.52 .14	43 2 0.3	31.49 .19	44.5 2.0
26.9	46.28 .19	51.3 1.6	13.94 .19	71.7 0.6	50.67 .17	43.4 +0.1	31.70 .23	42.4 2.1
Sept. 5.9	46.49 +.22	49.8 +1.3	14.14 +.22	71.1 −0.7	50.85 +.19	43.5 −0.1	31.95 +.27	40.4 −2.1
15.9	46.72 .25	48.7 0.9	14.38 .25	70.3 0.8	51.05 .22	43.3 0.3	32.24 .31	38.3 2.0
25.8	46.98 .27	48.1 +0.4	14.64 .27	69.4 0.9	51.29 .24	42 9 0.5	32.57 .34	36.4 1.9
Oct. 5.8	47.26 .29	47.9 0.0	14.92 .29	68.4 1.0	51.54 .27	42.2 0.8	32.93 .38	34.5 1.8
15.8	47.56 .30	48.2 −0.5	15.22 .31	67.3 1.1	51.82 .29	41.3 1.0	33.33 .41	32.8 1.6
25.8	47.87 +.31	49.0 −1.0	15.54 +.32	66.2 −1.2	52.11 +.30	40.2 −1.2	33.74 +.43	31.2 −1.4
Nov. 4.7	48.18 .31	50.3 1.5	15.86 .33	65.0 1.2	52.42 .31	38.9 1.4	34.18 .44	29.9 1.2
14.7	48.49 .31	52.0 1.9	16.20 .33	63.8 1.2	52.73 .31	37.5 1.5	34.63 .45	28.9 0.9
24.7	48.79 .29	54.0 2.2	16.53 .33	62.6 1.1	53.05 .31	35.9 1.6	35.09 .45	28.2 0.5
Dec. 4.6	49.08 .27	56.5 2.5	16.85 .31	61.5 1.0	53.35 .30	34.3 1.6	35.53 .43	27.8 −0.2
14.6	49.33 +.24	59.1 −2.7	17.15 +.28	60.5 −0.9	53.64 +.27	32.7 −1.6	35 95 +.40	27.9 +0.2
24.6	49.55 .20	61.9 2.8	17.42 .25	59.8 0.7	53.90 .24	31.1 1.5	36.33 .36	28.2 0.6
34.6	49.72 +.15	64.7 −2.8	17.65 +.21	59.2 −0.5	54.13 +.21	29.7 −1.3	36.67 +.31	29.0 +0.9

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	σ^2 Ursæ Majoris.		κ Cancri.		ι Argus.		1 Draconis (H.)	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*
	h m 9 0	° ′ +67 34	h m 9 1	° ′ +11 6	h m 9 14	° ′ −58 48	h m 9 20	° ′ +81 48
	s	″	s	″	s	″	s	″
Jan. 0.6	32.59 +.53	65.7 +1.6	41.12 +.24	61.7 −1.3	7.55 +.30	9.0 −3.4	66.38+1.33	59.1 +1.9
10.6	33.07 .42	67.5 2.0	41.34 .20	60.5 1.0	7.82 .23	12.5 3.6	67.61 1.10	61.3 2.4
20.5	33.44 .31	69.7 2.4	41.51 .15	59.6 0.8	8.00 .15	16.2 3.7	68.57 .83	63.8 2.7
30.5	33.70 .20	72.2 2.6	41.64 .10	58.8 0.6	8.11 +.06	20.0 3.7	69.26 .53	66.7 3.0
Feb. 9.5	33.83 +.07	74.8 2.7	41.71 +.05	58.4 0.4	8.13 −.02	23.6 3.6	69.63+ .22	69.7 3.1
19.5	33.84 −.05	77.5 +2.7	41.73 .00	58.1 −0.2	8.07 −.10	27.2 −3.4	69.70− .09	72.9 +3.1
29.4	33.73 .16	80.2 2.6	41.71 −.05	58.0 0.0	7.93 .17	30.5 3.2	69.45 .39	75.9 3.0
Mar. 10.4	33.52 .26	82.7 2.4	41.64 .08	58.1 +0.1	7.73 .23	33.5 2.8	68.92 .66	78.8 2.8
20.4	33.22 .34	84.9 2.1	41.54 .11	58.4 0.3	7.47 .28	36.1 2.4	68.13 .90	81.4 2.4
30.4	32.84 .40	86.8 1.7	41.41 .14	58.7 0.4	7.16 .32	38.3 2.0	67.14 1.08	83.7 2.0
Apr. 9.3	32.41 −.44	88.3 +1.3	41.27 −.15	59.1 +0.5	6.82 −.35	40.1 −1.5	65.97−1.21	85.5 +1.5
19.3	31.95 .46	89.4 0.8	41.12 .15	59.6 0.5	6.46 .37	41.4 1.0	64.69 1.31	86.7 1.0
29.3	31.48 .46	89.9 +0.3	40.97 .15	60.2 0.5	6.09 .37	42.1 −0.5	63.35 1.34	87.4 +0.5
May 9.2	31.03 .44	90.0 −0.2	40.82 .14	60.7 0.5	5.72 .37	42.4 0.0	62.00 1.32	87.5 −0.1
19.2	30.61 .40	89.6 0.6	40.69 .12	61.3 0.5	5.35 .35	42.1 +0.5	60.70 1.26	87.1 0.7
29.2	30.23 −.35	88.8 −1.1	40.59 −.10	61.8 +0.5	5.01 −.33	41.3 +1.0	59.49−1.15	86.1 −1.2
June 8.2	29.91 .29	87.4 1.5	40.50 .07	62.3 0.5	4.69 .30	40.1 1.5	58.40 1.00	84.6 1.7
18.1	29.66 .21	85.8 1.9	40.44 .05	62.8 0.5	4.41 .26	38.4 1.9	57.48 .83	82.7 2.1
28.1	29.48 .13	83.7 2.2	40.41 −.02	63.3 0.4	4.17 .21	36.2 2.3	56.75 .63	80.3 2.5
July 8.1	29.39 −.06	81.4 2.4	40.40 +.01	63.7 0.4	3.98 .17	33.8 2.6	56.22 .42	77.6 2.8
18.1	29.37 +.03	78.9 −2.6	40.42 +.04	64.1 +0.3	3.84 −.11	31.0 +2.9	55.90− .20	74.7 −3.1
28.0	29.44 .11	76.2 2.8	40.48 .07	64.3 0.2	3.76 −.05	28.1 3.0	55.82+ .03	71.5 3.2
Aug. 7.0	29.59 .19	73.4 2.8	40.56 .09	64.5 +0.1	3.74 +.02	25.0 3.1	55.95 .25	68.2 3.3
17.0	29.83 .27	70.5 2.9	40.67 .12	64.6 0.0	3.79 .08	21.9 3.0	56.32 .48	64.9 3.3
26.9	30.14 .35	67.7 2.8	40.80 .15	64.5 −0.2	3.91 .15	18.9 2.9	56.92 .70	61.5 3.3
Sept. 5.9	30.53 +.42	64.9 −2.7	40.97 +.18	64.2 −0.4	4.09 +.22	16.1 +2.6	57.73+ .91	58.3 −3.2
15.9	30.98 .49	62.2 2.6	41.16 .21	63.8 0.6	4.34 .28	13.7 2.3	58.74 1.11	55.1 3.0
25.9	31.51 .55	59.7 2.4	41.38 .23	63.1 0.8	4.65 .34	11.6 1.8	59.95 1.30	52.3 2.8
Oct. 5.8	32.09 .61	57.4 2.1	41.63 .26	62.3 1.0	5.02 .39	10.0 1.3	61.33 1.46	49.6 2.5
15.8	32.73 .66	55.5 1.8	41.90 .28	61.2 1.2	5.44 .44	9.0 0.7	62.86 1.59	47.3 2.1
25.8	33.41 +.70	53.8 −1.5	42.19 +.30	60.0 −1.3	5.90 +.47	8.7 +0.1	64.52+1.70	45.5 −1.6
Nov. 4.8	34.12 .72	52.5 1.1	42.50 .31	58.6 1.5	6.38 .49	8.9 −0.6	66.27 1.77	44.1 1.2
14.7	34.85 .73	51.7 0.6	42.82 .32	57.1 1.5	6.87 .49	9.8 1.2	68.07 1.81	43.2 0.6
24.7	35.59 .73	51.3 −0.1	43.14 .32	55.5 1.6	7.36 .48	11.4 1.8	69.89 1.80	42.8 −0.1
Dec. 4.7	36.30 .70	51.5 +0.4	43.46 .31	53.9 1.6	7.82 .45	13.5 2.4	71.67 1.74	43.1 +0.5
14.6	36.98 +.65	52.1 +0.9	43.77 +.29	52.4 −1.5	8.25 +.40	16.1 −2.9	73.37+1.63	43.9 +1.1
24.6	37.60 .58	53.2 1.3	44.05 .26	50.9 1.4	8.63 .34	19.2 3.2	74.93 1.47	45.2 1.6
34.6	38.14 +.50	54.8 +1.8	44.29 +.22	49.7 −1.2	8.94 +.27	22.6 −3.5	76.31+1.26	47.0 +2.1

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Hydræ.		δ Ursæ Majoris.		θ Ursæ Majoris.		ε Leonis.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 9 22	° ′ − 8 10	h m 9 24	° ′ +70 18	h m 9 25	° ′ +52 10	h m 9 39	° ′ +24 17
	s	″	s	″	s	″	s	″
Jan. 0.6	5.37 +.24	25.1 −2.4	34.62 +.63	65.0 +1.5	21.88 +.38	61.9 +0.7	29.63 +.29	15.2 −0.8
10.6	5.59 .20	27.4 2.3	35.20 .52	66.7 1.9	22.23 .32	62.8 1.1	29.90 .25	14.5 0.5
20.6	5.77 .15	29.7 2.1	35.67 .41	68.8 2.3	22.52 .25	64.1 1.4	30.12 .20	14.2 −0.2
30.5	5.90 .11	31.7 2.0	36.01 .27	71.3 2.6	22.74 .18	65.7 1.7	30 30 .15	14.1 +0.1
Feb. 9.5	5.98 .06	33.6 1.7	36.22 .14	74.0 2.8	22.88 .10	67.6 2.0	30.42 .10	14.4 0.4
19.5	6.02 +.01	35.2 −1.5	36.29 +.01	76.8 +2.8	22.94 +.02	69.6 +2.1	30.49 +.04	14.9 +0.6
29.5	6.00 −.03	36.6 1.2	36.23 −.13	79.6 2.7	22.93 −.05	71.7 2.1	30.50 −.01	15.6 0.8
Mar. 10.4	5.95 .07	37.7 1.0	36.04 .24	82.3 2.6	22.84 .12	73.9 2.1	30.47 .05	16.4 0.9
20.4	5.86 .10	38.5 0.7	35.74 .34	84.8 2.3	22.69 .17	75.9 1.9	30.39 .09	17.3 0.9
30.4	5.74 .13	39.1 0.5	35.35 .42	87.0 2.0	22.50 .21	77.7 1.7	30.29 .12	18.3 1.0
Apr. 9.3	5.60 −.14	39.5 −0.2	34.89 −.48	88.7 +1.6	22.27 −.24	79 2 +1.4	30.15 −.14	19.2 +0.9
19.3	5.46 .15	39.6 0.0	34.39 .52	90.1 1.1	22.01 .26	80.5 1.1	30.00 .15	20.2 0.9
29.3	5.31 .15	39.5 +0.2	33.86 .53	90.9 0.6	21.75 .26	81.4 0.7	29.85 .15	21.0 0.8
May 9.3	5.16 .14	39.2 0.4	33.34 .52	91.2 +0.1	21.49 .25	81.9 +0.3	29.70 .15	21.7 0.6
19.2	5.03 .13	38.8 0.6	32.83 .48	91.1 −0.4	21.24 .23	82.0 −0.1	29.55 .14	22.2 0.5
29.2	4.91 −.11	38.1 +0.7	32.37 −.44	90.4 −0.9	21.02 −.21	81.8 −0.4	29.42 −.12	22.6 +0.3
June 8.2	4.80 .09	37.3 0.9	31.96 .38	89.3 1.3	20.83 .17	81.2 0.8	29.31 .10	22.9 +0.2
18.2	4.73 .07	36.4 1.0	31.61 .30	87.7 1.8	20.68 .13	80.2 1.1	29.22 .09	23.0 0.0
28.1	4.67 .04	35.4 1.1	31.35 .22	85.7 2.1	20.57 .09	78.9 1.4	29.16 .06	22.9 −0.1
July 8.1	4.64 −.02	34.3 1.1	31.17 .14	83.4 2.4	20.50 −.04	77.3 1.7	29.13 −.02	22.7 0.3
18.1	4.63 +.01	33.2 +1.1	31.08 −.05	80.9 −2.7	20.48 .00	75.5 −1.9	29.12 +.01	22.4 −0.4
28.0	4.65 .03	32.0 1.1	31.08 +.05	78.1 2.9	20.51 +.05	73.5 2.1	29.14 .03	21.8 0.6
Aug. 7.0	4.70 .06	30.9 1.0	31.17 .14	75.1 3.0	20.58 .10	71.3 2.2	29.19 .06	21.2 0.7
17.0	4.78 .09	30.0 0.9	31.35 .23	72.1 3.0	20.70 .15	69.0 2.3	29.27 .09	20.4 0.9
27.0	4.89 .12	29.1 0.7	31.63 .32	69.1 3.0	20.87 .19	66.6 2.4	29.38 .12	19.4 1.0
Sept. 5.9	5.02 +.15	28.5 +0.5	31.99 +.40	66.0 −3.0	21.09 +.24	64.2 −2.4	29.52 +.16	18.3 −1.2
15.9	5.19 .18	28.2 +0.2	32.44 .49	63.1 2.9	21.35 .28	61.8 2.4	29.69 .19	17.0 1.3
25.9	5.38 .21	28.1 −0.1	32.97 .57	60.3 2.7	21.65 .33	59.4 2.3	29.89 .22	15.6 1.5
Oct. 5.9	5.61 .24	28.4 0.5	33.57 .64	57.7 2.4	22.00 .37	57.1 2.2	30.13 .25	14.1 1.6
15.8	5.86 .27	29.0 0.8	34.24 .70	55.4 2.1	22.39 .41	54.9 2.1	30.40 .28	12.5 1.7
25.8	6.14 +.29	30.0 −1.2	34.97 +.75	53.4 −1.8	22.82 +.44	52.9 −1.8	30.69 +.31	10.8 −1.7
Nov. 4.8	6.44 .30	31.4 1.5	35.75 .79	51.8 1.4	23.27 .46	51.2 1.6	31.01 .33	9.1 1.7
14.7	6.75 .31	33.0 1.8	36.55 .81	50.7 0.9	23.74 .48	49.8 1.2	31.35 .34	7.4 1.7
24.7	7.07 .32	34.9 2.0	37.37 .81	50.0 −0.4	24.22 .48	48.7 0.9	31.70 .35	5.7 1.6
Dec. 4.7	7.38 .31	37.1 2.2	38.18 .79	49.9 +0.1	24.71 .47	48.0 −0.4	32.05 .35	4.2 1.4
14.7	7.68 +.29	39.4 −2.3	38.96 +.75	50.3 +0.6	25.17 +.45	47.8 0.0	32.39 +.33	2.9 −1.2
24.6	7.96 .26	41.7 2.4	39.68 .69	51.2 1.2	25.61 .41	48.0 +0.4	32.72 .31	1.8 1.0
34.6	8.21 +.23	44.1 −2.3	40.33 +.60	52.6 +1.7	26.00 +.36	48.6 +0.8	33.01 +.28	1.0 −0.7

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	μ Leonis.		α Leonis. (*Regulus.*)		32 Ursæ Majoris.		γ^1 Leonis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 9 46	° ′ +26 31	h m 10 2	° ′ +12 30	h m 10 9	° ′ +65 39	h m 10 13	° ′ +20 24
	s	″	s	″	s	″	s	″
Jan. 0.6	23.58 +.30	55.1 −0.7	24.41 +.29	47.6 −1.4	53.61 +.59	45.3 +0.8	47.72 +.31	22.4 −1.2
10.6	23.86 .26	54.5 0.4	24.68 .25	46.3 1.2	54.17 .52	46.4 1.3	48.01 .27	21.3 0.9
20.6	24.10 .21	54.3 −0.1	24.90 .21	45.2 1.0	54.65 .43	47.9 1.7	48.25 .23	20.6 0.6
30.6	24.28 .15	54.4 +0.2	25.09 .16	44.3 0.7	55.04 .33	49.9 2.2	48.46 .18	20.2 −0.3
Feb. 9.5	24.41 .10	54.7 0.5	25.22 .11	43.8 0.4	55.32 .23	52.2 2.4	48.61 .13	20.1 0.0
19.5	24.49 +.05	55.3 +0.7	25.31 +.06	43.5 −0.2	55.50 +.12	54.7 +2.6	48.72 +.08	20.2 +0.3
29.5	24.51 .00	56.1 0.9	25.34 +.01	43.4 +0.1	55.56 +.01	57.5 2.7	48.77 +.03	20.7 0.5
Mar. 10.4	24.48 −.05	57.1 1.0	25.33 −.03	43.6 0.3	55.51 −.09	60.2 2.7	48.77 −.02	21.3 0.7
20.4	24.41 .08	58.1 1.1	25.28 .07	43.9 0.4	55.37 .18	62.8 2.5	48.73 .06	22.1 0.8
30.4	24.31 .12	59.2 1.1	25 20 .10	44.4 0.5	55.14 .26	65.3 2.3	48.65 .09	22.9 0.9
Apr. 9.4	24.18 −.14	60.3 +1.0	25.09 −.12	45.0 +0.6	54.84 −.33	67.5 +2.0	48.55 −.11	23.9 +0.9
19.3	24.03 .15	61.3 0.9	24.97 .13	45.7 0.7	54.48 .37	69.3 1.6	48.43 .13	24.8 0.9
29.3	23.87 .16	62.2 0.8	24.84 .14	46.3 0.7	54.10 .40	70.7 1.1	48.30 .14	25.7 0.8
May 9.3	23.72 .15	62.9 0.7	24.70 .13	47.0 0.7	53.69 .40	71.6 0.7	48.16 .14	26.5 0.8
19.3	23.57 .14	63.5 0.5	24.57 .12	47.6 0.6	53.29 .40	72.0 +0.2	48.02 .13	27.2 0.7
29.2	23.44 −.13	63.9 +0.3	24.45 −.11	48.3 +0.6	52.90 −.38	72.0 −0.2	47.90 −.12	27.8 +0.5
June 8.2	23.32 .11	64.1 +0.1	24.34 .10	48.8 0.5	52.54 .34	71.5 0.8	47.78 .11	28.3 0.4
18.2	23.22 .08	64.2 0.0	24.25 .08	49.3 0.5	52.21 .30	70.5 1.2	47.68 .09	28.6 0.2
28.2	23.15 .06	64.0 −0.2	24.18 .06	49.7 0.4	51.94 .25	69.0 1.6	47.60 .07	28.7 +0.1
July 8.1	23.11 −.03	63.7 0.4	24.13 .04	50.1 0.3	51.72 .19	67.2 2.0	47.54 .05	28.8 −0.1
18.1	23.10 .00	63.3 −0.5	24.10 −.02	50.3 +0.2	51.56 −.12	65.0 −2.3	47.51 −.02	28.6 −0.2
28.1	23.11 +.03	62.6 0.7	24.10 +.01	50.4 +0.1	51.47 −.06	62.5 2.6	47.50 .00	28.3 0.4
Aug. 7.0	23.15 .06	61.8 0.9	24.12 .04	50.4 −0.1	51.45 +.01	59.8 2.8	47.51 +.03	27.8 0.5
17.0	23.23 .09	60.9 1.0	24.17 .06	50.2 0.2	51.50 .08	56.9 3.0	47.55 .06	27.2 0.7
27.0	23.33 .12	59.8 1.2	24.25 .09	49.9 0.4	51.62 .16	53.8 3.1	47.62 .09	26.4 0.9
Sept. 6.0	23.46 +.15	58.5 −1.3	24.36 +.12	49.4 −0.6	51.81 +.23	50.7 −3.1	47.72 +.12	25.4 −1.1
15.9	23.63 .18	57.1 1.5	24.49 .15	48.7 0.8	52.08 .30	47.6 3.1	47.86 .15	24.2 1.3
25.9	23.83 .22	55.5 1.6	24.66 .19	47.8 1.0	52.42 .37	44.5 3.0	48.02 .18	22.9 1.5
Oct. 5.9	24.07 .25	53.9 1.7	24.86 .22	46.7 1.2	52.83 .44	41.5 2.9	48.22 .22	21.4 1.6
15.8	24.33 .28	52.2 1.8	25.10 .25	45.4 1.4	53.31 .51	38.7 2.7	48.46 .25	19.7 1.7
25.8	24.63 +.31	50.4 −1.8	25.36 +.28	43.9 −1.6	53.85 +.57	36.1 −2.4	48.72 +.28	17.9 −1.8
Nov. 4.8	24.95 .33	48.6 1.8	25.65 .30	42.3 1.7	54.44 .61	33.9 2.1	49.02 .31	16.0 1.9
14.8	25.29 .35	46.8 1.7	25.97 .32	40.5 1.8	55.08 .65	32.0 1.6	49.34 .33	14.1 1.9
24.7	25.64 .36	45.2 1.6	26.29 .33	38.7 1.8	55.74 .67	30.6 1.2	49.68 .34	12.3 1.8
Dec. 4.7	26.00 .35	43.7 1.4	26.62 .33	36.8 1.8	56.42 .68	29.7 0.7	50.02 .35	10.4 1.7
14.7	26.35 +.34	42.3 −1.2	26.95 +.32	35.1 −1.7	57.10 +.66	29.3 −0.1	50.37 +.34	8.8 −1.6
24.7	26.68 .32	41.3 0.9	27.27 .30	33.4 1.6	57.74 .62	29.4 +0.4	50.70 .32	7.3 1.4
34.6	26.99 +.29	40.5 −0.6	27.56 +.28	31.9 −1.4	58.34 +.57	30.1 +0.9	51.01 +.30	6.1 −1.1

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	9 Draconis (H.)		ρ Leonis.		η Argus.		l Leonis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*
	h m 10 25	° ′ +76 16	h m 10 26	° ′ + 9 52	h m 10 40	° ′ −59 5	h m 10 43	° ′ +11 7
	s	″	s	″	s	″	s	″
Jan. 0.7	33.90 +.98	66.9 +1.0	54.73 +.30	55.0 −1.6	44.37 +.43	28.0 −2.8	22.01 +.31	73.1 −1.7
10.6	34.83 .87	68.2 1.5	55.02 .26	53.5 1.4	44.78 .38	31.0 3.2	22.31 .28	71.5 1.4
20.6	35.65 .74	69.9 2.0	55.26 .22	52.2 1.2	45.12 .31	34.3 3.4	22.56 .24	70.2 1.2
30.6	36.31 .58	72.2 2.4	55.46 .18	51.1 0.9	45.40 .24	37.8 3.6	22.78 .20	69.1 0.9
Feb. 9.6	36.82 .41	74.8 2.7	55.62 .13	50.3 0.6	45.60 .16	41.5 3.7	22.96 .15	68.4 0.6
19.5	37.13 +.22	77.6 +2.9	55.73 +.08	49.8 −0.4	45.72 +.08	45.2 −3.6	23.08 +.10	67.9 −0.3
29.5	37.26 +.04	80.6 3.0	55.79 +.04	49.6 −0.1	45.76 +.01	48.8 3.5	23.16 .05	67.7 −0.1
Mar. 10.5	37.21 −.14	83.7 3.0	55.80 .00	49.6 +0.1	45.73 −.06	52.3 3.4	23.19 +.01	67.8 +0.2
20.4	36.99 .30	86.6 2.8	55.78 −.04	49.8 0.3	45.63 .13	55.5 3.1	23.18 −.03	68.1 0.4
30.4	36.61 .45	89.3 2.6	55.72 .07	50.2 0.4	45.47 .18	58 5 2.8	23.14 .06	68.5 0.5
Apr. 9.4	36.09 −.57	91.7 +2.2	55.63 −.10	50.6 +0.5	45.26 −.23	61.1 −2.4	23.06 −.08	69.1 +0.6
19.4	35.47 .66	93.7 1.8	55.53 .11	51.2 0 6	45.01 .27	63.3 2.0	22.97 .10	69.7 0.7
29.3	34.77 .72	95.3 1.3	55.41 .12	51.9 0.7	44.72 .30	65.1 1.6	22.86 .12	70.4 0.7
May 9.3	34.03 .75	96.3 0.8	55.28 .12	52.6 0.7	44.41 .32	66.5 1.1	22.74 .12	71.2 0.7
19.3	33.27 .76	96.8 +0.2	55.16 .12	53.2 0.7	44.09 .33	67.3 0.6	22.61 .12	71.9 0.7
29.3	32.52 −.73	96.7 −0.3	55.04 −.12	53.9 +0.6	43.76 −.33	67.7 −0.1	22.50 −.12	72.6 +0.7
June 8.2	31.80 .69	96.1 0.9	54.93 .10	54.5 0.6	43.43 .33	67.5 +0.4	22.38 .11	73.3 0.6
18.2	31.14 .62	95.0 1.4	54.83 .09	55.1 0.5	43.11 .31	66.8 0.9	22.28 .10	73.8 0.5
28.2	30.56 .54	93.4 1.8	54.75 .07	55.6 0.5	42.80 .29	65.7 1.3	22.19 .08	74.3 0.4
July 8.1	30.07 .45	91.3 2.2	54.68 .05	56.0 0.4	42.52 .26	64.1 1.8	22.12 .06	74.7 0.3
18.1	29.68 −.34	88.9 −2.6	54.64 −.03	56.4 +0.3	42.28 −.23	62.2 +2.2	22.07 −.05	75.0 +0.2
28.1	29.41 .21	86.1 2.9	54.62 −.01	56.6 +0.2	42.07 .18	59.8 2.5	22.03 −.03	75.2 +0.1
Aug. 7.1	29.25 −.09	83.0 3.1	54.61 +.01	56.7 0.0	41.92 .13	57.3 2.7	22.01 .00	75.2 −0.1
17.0	29.22 +.03	79.8 3.3	54.64 .04	56.7 −0.1	41.82 −.07	54.5 2.8	22.02 +.02	75.1 0.2
27.0	29.32 .17	76.4 3.4	54.69 .07	56.5 0.3	41.78 .00	51.6 2.9	22.06 .05	74.8 0.4
Sept. 6.0	29.55 +.30	73.0 −3.5	54.77 +.10	56.1 −0.5	41.81 +.07	48.7 +2.8	22.12 +.08	74.3 −0.6
16.0	29.91 .42	69.5 3.4	54.88 .13	55.5 0.7	41.92 .14	45.9 2.6	22.22 .11	73.6 0.8
25.9	30.40 .55	66.1 3.3	55.03 .16	54.7 0.9	42.09 .21	43.4 2.4	22.35 .15	72.7 1.0
Oct. 5.9	31.02 .67	62.8 3.2	55.21 .20	53.7 1.2	42.34 .29	41.2 2.0	22.51 .18	71.5 1.3
15.9	31.75 .79	59.8 2.9	55.42 .23	52.4 1.4	42.67 .35	39.4 1.5	22.71 .22	70.2 1.5
25.8	32.59 +.89	57.0 −2.6	55.67 +.26	50.9 −1.6	43.05 +.41	38.1 +1.0	22.95 +.25	68.6 −1.7
Nov. 4.8	33.53 .98	54.6 2.2	55.94 .29	49.3 1.7	43.49 .46	37.4 +0.4	23.22 .28	66.9 1.8
14.8	34.55 1.04	52.7 1.7	56.25 .30	47.4 1.9	43 97 .49	37.3 −0.2	23.51 .31	65.0 1.9
24.8	35.62 1.09	51.2 1.2	56.57 .31	45.5 1.9	44.48 .51	37.9 0.9	23.83 .32	63.0 2.0
Dec. 4.7	36.73 1.10	50.3 −0.6	56.90 .33	43.6 1.9	44.99 .51	39.1 1.5	24.16 .33	61.0 2.0
14.7	37.83+1.08	50.0 0.0	57.23 +.33	41.7 −1.9	45.50 +.50	40.8 −2.0	24.50 +.33	59.0 −1.9
24.7	38.90 1.03	50.2 +0.5	57.55 .31	39.8 1.8	45.98 .46	43.1 2.5	24.82 .32	57.2 1.8
34.6	39.90+ .97	51.1 +1.1	57.85 +.29	38.2 −1.6	46.42 +.41	45.9 −3.0	25.13 +.30	55.5 −1.6

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Majoris.		δ Leonis.		δ Crateris.		τ Leonis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*
	h m 10 56	° ′ +62 20	h m 11 8	° ′ +21 7	h m 11 13	° ′ −14 10	h m 11 22	° ′ + 3 28
	s	″	s	″	s	″	s	″
Jan. 0.7	48.14 +.58	65.8 0.0	8.70 +.33	69.1 −1.6	44.36 +.31	14.8 −2.3	10.28 +.32	23.8 −2.0
10.7	48.70 .52	66.1 +0.6	9.01 .30	67.7 1.2	44.66 .29	17.2 2.3	10.59 .29	21.9 1.8
20.6	49.19 .46	67.0 1.2	9.30 .27	66.7 0.8	44.93 .25	19.5 2.3	10.87 .26	20.1 1.6
30.6	49.62 .38	68.4 1.6	9.55 .23	66.1 0.5	45.16 .21	21.8 2.2	11.11 .22	18.6 1.4
Feb. 9.6	49.96 .30	70.3 2.1	9.76 .18	65.8 −0.1	45.35 .17	23.9 2.1	11.31 .18	17.3 1.1
19.5	50.22 +.20	72.6 +2.4	9.91 +.13	65.9 +0.2	45.50 +.12	25.9 −1.9	11.47 +.14	16.3 −0.9
29.5	50.37 .11	75.1 2.6	10.02 .09	66.2 0.5	45.60 .08	27.7 1.6	11.58 .09	15.6 0.6
Mar. 10.5	50.43 +.01	77.8 2.7	10.09 +.04	66.9 0.7	45.66 +.04	29.2 1.4	11.65 .05	15.1 0.3
20.5	50.40 −.07	80.5 2.7	10.10 .00	67.7 0.9	45.67 .00	30.4 1.1	11.68 +.01	14.9 −0.1
30.4	50.28 .15	83.1 2.6	10.08 −.04	68.7 1.0	45.65 −.04	31.4 0.9	11.67 −.02	15.0 +0.1
Apr. 9.4	50.09 −.22	85.6 +2.3	10.02 −.07	69.8 +1.1	45.60 −.06	32.2 −0.6	11.63 −.05	15.2 +0.3
19.4	49.85 .27	87.8 2.0	9.94 .09	71.0 1.1	45.52 .08	32.7 0.4	11.57 .07	15.5 0.4
29.4	49.56 .31	89.7 1.7	9.83 .11	72.1 1.1	45.43 .10	33.0 −0.2	11.49 .09	16.0 0.5
May 9.3	49.23 .33	91.1 1.2	9.72 .12	73.1 1.0	45.32 .11	33.0 +0.1	11.39 .10	16.6 0.6
19.3	48.90 .34	92.1 0.8	9.59 .12	74.1 0.9	45.21 .12	32.9 0.3	11.29 .11	17.2 0.6
29.3	48.55 −.34	92.7 +0.3	9.47 −.12	74.9 +0.8	45.09 −.12	32.5 +0.5	11.18 −.11	17.9 +0.7
June 8.3	48.22 .32	92.8 −0.2	9.35 .12	75.6 0.6	44.97 .12	32.0 0.6	11.07 .11	18.6 0.7
18.2	47.90 .30	92.4 0.6	9.23 .11	76.1 0.4	44.86 .11	31.2 0.8	10.97 .10	19.2 0.7
28.2	47.62 .27	91.5 1.1	9.13 .10	76.4 +0.2	44.75 .10	30.4 0.9	10.87 .09	19.9 0.6
July 8.2	47.37 .23	90.1 1.5	9.04 .08	76.5 0.0	44.65 .09	29.4 1.0	10.78 .09	20.5 0.6
18.1	47.16 −.18	88.4 −1.9	8.96 −.07	76.5 −0.2	44.57 −.08	28.3 +1.1	10.70 −.07	21.1 +0.5
28.1	47.00 .14	86.3 2.3	8.90 .05	76.2 0.4	44.49 .06	27.1 1.2	10.63 .06	21.6 0.4
Aug. 7.1	46.89 .08	83.8 2.6	8.86 −.03	75.7 0.6	44.44 .04	26.0 1.2	10.58 .04	21.9 0.3
17.1	46.84 −.02	81.1 2.8	8.85 .00	75.0 0.8	44.41 −.02	24.8 1.1	10.55 −.02	22.2 +0.2
27.0	46.84 +.04	78.2 3.0	8.86 +.03	74.1 1.0	44.40 +.01	23.7 1.0	10.55 +.01	22.3 0.0
Sept. 6.0	46.91 +.10	75.1 −3.2	8.90 +.06	73.0 −1.2	44.43 +.04	22.7 +0.9	10.57 +.04	22.2 −0.2
16.0	47.05 .17	71.8 3.3	8.98 .09	71.7 1.4	44.49 .08	22.0 0.7	10.63 .07	21.9 0.4
26.0	47.25 .24	68.6 3.3	9.09 .13	70.1 1.6	44.58 .11	21.4 0.4	10.72 .11	21.4 0.6
Oct. 5.9	47.52 .31	65.3 3.2	9.24 .17	68.4 1.8	44.72 .15	21.2 +0.1	10.84 .14	20.7 0.9
15.9	47.86 .37	62.1 3.1	9.42 .20	66.5 2.0	44.89 .19	21.3 −0.2	11.01 .18	19.6 1.1
25.9	48.27 +.44	59.1 −2.9	9.65 +.24	64.5 −2.1	45.10 +.23	21.7 −0.6	11.21 +.22	18.4 −1.4
Nov. 4.8	48.74 .49	56.3 2.6	9.91 .28	62.3 2.2	45.35 .27	22.5 1.0	11.45 .26	16.8 1.6
14.8	49.26 .54	53.8 2.3	10.20 .31	60.2 2.2	45.64 .30	23.6 1.3	11.72 .29	15.1 1.8
24.8	49.83 .58	51.7 1.9	10.52 .33	58.0 2.2	45.95 .32	25.1 1.6	12.02 .31	13.2 2.0
Dec. 4.8	50.42 .60	50.1 1.4	10.86 .34	55.8 2.1	46.27 .33	26.9 1.9	12.34 .32	11.1 2.1
14.7	51.03 +.61	48.9 −0.9	11.21 +.35	53 9 −1.9	46.60 +.33	28.9 −2.1	12.67 +.33	9.0 −2.1
24.7	51.63 .59	48.3 −0.3	11.56 .34	52.1 1.7	46.93 .32	31.1 2.3	13.00 .32	6.9 2.1
34.7	52.22 +.56	48.3 +0.3	11.90 +.33	50.6 −1.4	47.25 +.30	33.5 −2.4	13.32 +.32	4.9 −2.0

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	λ Draconis.		υ Leonis.		β Leonis.		γ Ursæ Majoris.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 11 24	° ′ +69 56	h m 11 31	° ′ − 0 12	h m 11 43	° ′ +15 11	h m 11 47	° ′ +54 18
	s	″	s	″	s	″	s	″
Jan. 0.7	43.90 +.75	42.1 0.0	12.48 +.32	17.1 −2.1	20.24 +.33	51.0 −1.8	55.41 +.50	50.2 −0.9
10.7	44.64 .71	42.3 +0.5	12.79 .29	19.1 2.0	20.56 .31	49.3 1.5	55.89 .47	49.6 −0.3
20.7	45.32 .64	43.2 1.1	13.07 .26	21.0 1.8	20.86 .28	47.9 1.2	56.34 .43	49.7 +0.3
30.6	45.92 .55	44.6 1.7	13.32 .23	22.7 1.6	21.12 .25	46.9 0.9	56.75 .38	50.2 0.9
Feb. 9.6	46.43 .45	46.5 2.1	13.52 .19	24.2 1.4	21.35 .21	46.1 0.6	57.10 .32	51.4 1.4
19.6	46.82 +.33	48.9 +2.5	13.69 +.14	25.5 −1.1	21.54 +.16	45.8 −0.2	57.39 +.25	53.0 +1.8
29.5	47.08 .20	51.6 2.8	13.81 .10	26.4 0.8	21.68 .12	45.7 +0.1	57.60 .18	54.9 2.1
Mar. 10.5	47.22 +.08	54.4 2.9	13.89 .06	27.1 0.6	21.77 .07	45.9 0.4	57.74 .10	57.2 2.4
20.5	47.24 −.04	57.4 2.9	13.93 +.02	27.5 0.3	21.82 +.03	46.4 0.6	57.81 +.03	59.7 2.5
30.5	47.14 .15	60.3 2.8	13.93 −.02	27.7 −0.1	21.8` −.01	47.1 0.8	57.81 −.03	62.3 2.6
Apr. 9.4	46.93 −.25	63.1 +2.6	13.90 −.04	27.7 +0.1	21.81 −.04	48.0 +0.9	57.74 −.09	64.8 +2.5
19.4	46.63 .34	65.6 2.3	13.84 .07	27.6 0.2	21.76 .06	48.9 1.0	57.62 .14	67.2 2.3
29.4	46.26 .40	67.8 2.0	13.76 .08	27.2 0.4	21.69 .08	50.0 1.0	57.45 .18	69.5 2.1
May 9.3	45.83 .45	69.5 1.5	13.67 .10	26.8 0.5	21.60 .10	51.0 1.0	57.25 .21	71.4 1.8
19.3	45.36 .48	70.8 1.0	13.57 .10	26.3 0.6	21.49 .11	51.9 0.9	57.03 .23	73.0 1.4
29.3	44.87 −.49	71.6 +0.5	13.47 −.11	25.7 +0.6	21.38 −.11	52.8 +0.9	56.80 −.25	74.2 +1.0
June 8.3	44.38 .49	71.8 0.0	13.36 .11	25.0 0.7	21.27 .11	53.6 0.7	56.55 .25	74.9 0.5
18.2	43.90 .47	71.6 −0.5	13.26 .10	24.3 0.7	21.16 .11	54.3 0.6	56.30 .25	75.2 +0.1
28.2	43.45 .44	70.8 1.0	13.15 .10	23.6 0.7	21.05 .10	54.8 0.4	56.06 .24	75.1 −0.4
July 8.2	43.03 .39	69.5 1.5	13.06 .09	23.0 0.7	20.95 .10	55.2 0.3	55.83 .22	74.5 0.8
18.2	42.66 −.34	67.7 −2.0	12.98 −.08	22.3 +0.6	20.85 −.09	55.4 +0.1	55.62 −.19	73.5 −1.2
28.1	42.35 .28	65.6 2.4	12.90 .06	21.7 0.6	20.77 .07	55.5 −0.1	55.44 .17	72.0 1.6
Aug. 7.1	42.11 .21	63.0 2.7	12.85 .04	21.1 0.5	20.71 .06	55.3 0.3	55.30 .14	70.2 2.0
17.1	41.93 .13	60.1 3.0	12.81 −.03	20.7 0.4	20.66 .04	54.9 0.5	55.18 .10	68.0 2.3
27.0	41.84 −.05	57.0 3.2	12.80 .00	20.4 +0.2	20.64 −.01	54.4 0.7	55.11 .05	65.5 2.6
Sept. 6.0	41.83 +.03	53.7 −3.4	12.81 +.03	20.3 0.0	20.64 +.02	53.6 −0.9	55.08 −.01	62.8 −2.9
16.0	41.91 .13	50.2 3.5	12.85 .06	20.3 −0.2	20.67 .05	52.6 1.1	55.11 +.04	59.8 3.1
26.0	42.08 .22	46.6 3.6	12.93 .10	20.6 0.4	20.74 .09	51.4 1.3	55.20 .10	56.6 3.2
Oct. 5.9	42.34 .31	43.0 3.5	13.05 .14	21.2 0.7	20.85 .13	49.9 1.6	55.33 .16	53.3 3.3
15.9	42.71 .41	39.6 3.4	13.20 .18	22.0 1.0	20.99 .17	48.3 1.8	55.53 .22	50.1 3.3
25.9	43.16 +.50	36.2 −3.2	13.40 +.21	23.1 −1.2	21.18 +.21	46.4 −2.0	55.78 +.28	46.8 −3.2
Nov. 4.9	43.70 .58	33.2 2.9	13.63 .25	24.5 1.5	21.41 .25	44.3 2.1	56.09 .34	43.6 3.1
14.8	44.33 .66	30.4 2.6	13.90 .28	26.1 1.7	21.67 .28	42.2 2.2	56.46 .39	40.6 2.9
24.8	45.02 .72	28.0 2.1	14.19 .31	28.0 1.9	21.97 .31	39.9 2.2	56.89 .43	37.9 2 6
Dec. 4.8	45.76 .76	26.1 1.6	14.51 .32	30.0 2.0	22.29 .33	37.7 2.2	57.35 .47	35.5 2.2
14.8	46.53 +.78	24.8 −1.1	14.84 +.33	32.1 −2.1	22.62 +.34	35.5 −2.1	57.83 +.49	33.6 −1.7
24.7	47.32 .77	24.0 −0.5	15.17 .33	34.2 2.1	22.96 .34	33.5 2 0	58.33 .49	32.1 1.2
34.7	48.08 +.75	23.8 +0.1	15.49 +.31	36.3 −2.0	23.29 +.32	31.6 −1.7	58.83 +.48	31.2 −0.6

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	o Virginis.		4 Draconis (H.)		γ Corvi.		β Chamæleontis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*
	h m 11 59	° ′ + 9 20	h m 12 6	° ′ +78 13	h m 12 10	° ′ −16 55	h m 12 11	° ′ −78 40
	s	″	s	″	s	″	s	″
Jan. 0.7	29.61 +.33	78.4 −2.0	55.10+1.23	64.2 −0.4	2.34 +.34	2.4 −2.2	49.63+1.19	59.2 −1.4
10.7	29.93 .31	76.6 1.8	56.31 1.18	64.1 +0.2	2.66 .32	4.6 2.3	50.79 1.12	60.9 2.0
20.7	30.23 .29	74.9 1.5	57.46 1.11	64.6 0.9	2.97 .29	6.9 2.3	51.87 1.02	63.2 2.5
30.6	30.50 .25	73.5 1.2	58.52 1.00	65.8 1.5	3.25 .26	9.2 2.2	52.83 .89	65.9 2.9
Feb. 9.6	30.74 .21	72.5 0.9	59.45 .85	67.5 2.0	3.48 .22	11.4 2.1	53.65 .75	69.1 3.3
19.6	30.93 +.17	71.7 −0.6	60.23+ .68	69.8 +2.5	3.69 +.18	13.4 −2.0	54.32+ .59	72.5 −3.5
29.6	31.08 .13	71.3 −0.3	60.82 .49	72.4 2.8	3.85 .14	15.3 1.8	54.82 .42	76.2 3.7
Mar. 10.5	31.19 .09	71.2 0.0	61.21 .29	75.4 3.0	3.96 .10	17.0 1.6	55.16 .25	80.0 3.8
20.5	31.26 .05	71.3 +0.3	61.40+ .09	78.4 3.1	4.04 .06	18.5 1.3	55.32+ .08	83.8 3.8
30.5	31.29 +.01	71.7 0.5	61.38− .11	81.6 3.1	4.08 +.02	19.7 1.1	55.31− .09	87.5 3.7
Apr. 9.5	31.28 −.02	72.2 +0.6	61.17− .30	84.6 +2.9	4.08 −.01	20.7 −0.9	55.15− .24	91.1 −3.5
19.4	31.25 .05	72.9 0.7	60.79 .46	87.4 2.7	4.06 .04	21.4 0.6	54.83 .39	94.5 3.3
29.4	31.19 .07	73.7 0.8	60.25 .60	89.9 2.3	4.01 .06	22.0 0.4	54.36 .53	97.7 3.0
May 9.4	31.12 .08	74.6 0.8	59.58 .72	92.1 1.9	3.94 .08	22.3 −0.2	53.77 .65	100.5 2.6
19.3	31.03 .09	75.4 0.8	58.81 .81	93.8 1.4	3.86 .09	22.4 0.0	53.06 .75	102.9 2.2
29.3	30.93 −.10	76.3 +0.8	57.97− .86	95.0 +0.9	3.76 −.10	22.3 +0.2	52.26− .84	104.9 −1.7
June 8.3	30.83 .10	77.0 0.7	57.09 .89	95.6 +0.4	3.66 .11	22.0 0.4	51.38 .91	106.3 1.2
18.3	30.72 .11	77.8 0.7	56.18 .90	95.7 −0.2	3.54 .11	21.5 0.5	50.44 .96	107.3 0.7
28.2	30.61 .11	78.4 0.6	55.29 .87	95.2 0.7	3.43 .12	20.9 0.7	49.46 .98	107.7 −0.1
July 8.2	30.51 .10	78.9 0.5	54.44 .83	94.2 1.3	3.31 .11	20.1 0.8	48.48 .97	107.5 +0.4
18.2	30.41 −.09	79.3 +0.3	53.63− .77	92.7 −1.8	3.20 −.11	19.3 +0.9	47.52− .94	106.8 +0.9
28.2	30.33 .08	79.6 +0.2	52.91 .68	90.7 2.2	3.10 .10	18.3 1.0	46.60 .87	105.6 1.5
Aug. 7.1	30.25 .07	79.7 0.0	52.27 .58	88.3 2.6	3.00 .09	17.2 1.1	45.77 .78	103.9 1.9
17.1	30.19 .05	79.7 −0.1	51.74 .47	85.4 3.0	2.92 .07	16.1 1.1	45.04 .66	101.7 2.4
27.1	30.15 −.03	79.4 0.3	51.33 .34	82.3 3.3	2.87 .04	15.1 1.0	44.45 .51	99.2 2.7
Sept. 6.0	30.14 .00	79.0 −0.5	51.06− .20	78.9 −3.5	2.84 −.01	14.1 +0.9	44.02− .34	96.4 +2.9
16.0	30.16 +.03	78.3 0.8	50.91− .05	75.2 3.7	2.81 +.02	13.2 0.8	43.77− .15	93.4 3.0
26.0	30.21 .07	77.5 1.0	50.93+ .11	71.5 3.8	2.87 .06	12.5 0.6	43.73+ .06	90.3 3.0
Oct. 6.0	30.30 .11	76.3 1.2	51.15 .27	67.7 3.8	2.95 .10	12.1 +0.3	43.89 .27	87.3 2.9
15.9	30.43 .15	75.0 1.5	51.50 .43	63.9 3.7	3.07 .14	11.9 0.0	44.26 .47	84.5 2.7
25.9	30.60 +.19	73.4 −1.7	52.01+ .59	60.2 −3.5	3.24 +.19	12.1 −0.3	44.84+ .67	81.9 +2.4
Nov. 4.9	30.81 .23	71.6 1.9	52.68 .75	56.8 3.3	3.45 .23	12.6 0.7	45.60 .84	79.7 1.9
14.8	31.06 .27	69.5 2.1	53.51 .89	53.6 3.0	3.70 .27	13.4 1.0	46.53 .99	78.1 1.4
24.8	31.34 .30	67.4 2.2	54.47 1.02	50.9 2 5	3.99 .30	14.6 1.4	47.59 1.11	76.9 0.8
Dec. 4.8	31.65 .32	65.2 2.2	55.54 1.12	48.6 2.0	4.30 .32	16.1 1.7	48.74 1.18	76.4 +0.2
14.8	31.98 +.33	63.0 −2.2	56.70+1.18	46.8 −1.5	4.63 +.33	17.9 −1.9	49.95+1.22	76.5 −0.4
24.7	32.31 .33	60.9 2.1	57.91 1.22	45.6 0.8	4.97 .33	20.0 2.1	51.17 1.21	77.3 1.1
34.7	32.64 +.33	58.9 −1.9	59.14+1.24	45.1 −0.2	5.31 +.33	22.2 −2.3	52.37+1.17	78.7 −1.7

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	η Virginis.		α^1 Crucis.		β Corvi.		κ Draconis.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*
	h m s 12 14	° ′ ″ − 0 2	h m s 12 20	° ′ ″ −62 28	h m s 12 28	° ′ ″ −22 46	h m s 12 28	° ′ ″ +70 23
Jan. 0.7	9.93 +.33	35.9 −2.1	22.68 +.57	18.7 −1.6	29.72 +.34	26.0 −2.1	40.34 +.77	66.3 −0.9
10.7	10.25 .31	37.9 2.0	23.24 .54	20.6 2.2	30.06 .33	28.2 2.2	41.11 .76	65.7 −0.3
20.7	10.56 .29	39.9 1.8	23.76 .50	23.0 2.6	30.38 .31	30.5 2.3	41.86 .73	65.8 +0.3
30.7	10.83 .26	41.6 1.6	24.23 .44	25.8 2.9	30.67 .28	32.9 2.4	42.56 .67	66.4 1.0
Feb. 9.6	11.07 .22	43.1 1.4	24.65 .38	28.9 3.2	30.93 .24	35.2 2.3	43.19 .59	67.7 1.5
19.6	11.27 +.18	44.4 −1.1	24.99 +.31	32.3 −3.4	31.16 +.20	37.5 −2.2	43.73 +.49	69.5 +2.1
29.6	11.44 .14	45.4 0.9	25.26 .23	35.7 3.5	31.34 .16	39.6 2.0	44.17 .37	71.8 2.5
Mar. 10.5	11.56 .10	46.1 0.6	25.46 .16	39.3 3.5	31.48 .12	41.6 1.9	44.48 .25	74.5 2.8
20.5	11.64 .06	46.5 0.3	25.57 .08	42.7 3.4	31.57 .08	43.4 1.7	44.67 .13	77.4 2.9
30.5	11.68 +.03	46.7 −0.1	25.62 +.01	46.1 3.3	31.63 .04	44.9 1.4	44.75 +.01	80.4 3.0
Apr. 9.5	11.69 .00	46.7 +0.1	25.60 −.05	49.4 −3.1	31.66 +.01	46.3 −1.2	44.70 −.10	83.4 +3.0
19.4	11.68 −.03	46.5 0.3	25.52 .11	52.4 2.9	31.65 −.02	47.4 1.0	44.54 .20	86.3 2.8
29.4	11.63 .05	46.2 0.4	25.38 .17	55.0 2.5	31.62 .04	48.3 0.8	44.29 .29	89.0 2.5
May 9.4	11.57 .07	45.7 0.5	25.19 .22	57.4 2.2	31.56 .07	48.9 0.5	43.95 .37	91.4 2.2
19.4	11.50 .08	45.2 0.6	24.95 .26	59.4 1.8	31.49 .08	49.3 0.3	43.55 .43	93.3 1.8
29.3	11.41 −.09	44.6 +0.6	24.67 −.29	61.0 −1.3	31.40 −.10	49.5 −0.1	43.10 −.47	94.9 +1.3
June 8.3	11.31 .10	43.9 0.7	24.36 .32	62.1 0.9	31.29 .11	49.4 +0.2	42.61 .50	95.9 0.8
18.3	11.21 .10	43.2 0.7	24.01 .34	62.7 −0.4	31.18 .12	49.2 0.4	42.10 .51	96.4 +0.3
28.2	11.11 .10	42.6 0.7	23.68 .35	62.9 +0.1	31.06 .12	48.7 0.6	41.59 .51	96.4 −0.3
July 8.2	11.00 .10	41.9 0.6	23.32 .35	62.6 0.6	30.93 .13	48.0 0.8	41.08 .49	95.9 0.8
18.2	10.90 −.10	41.3 +0.6	22.97 −.35	61.7+ 1.0	30.81 −.12	47.2 +0.9	40.60 −.47	94.8 −1.3
28.2	10.81 .09	40.7 0.5	22 63 .33	60.5 1.5	30.68 .12	46.2 1.1	40.15 .43	93.2 1.8
Aug. 7.1	10.72 .08	40.2 0.4	22.31 .29	58.7 1.9	30.57 .11	45.0 1.2	39.75 .38	91.2 2.2
17.1	10.65 .06	39.9 0.3	22.04 .25	56.7 2.2	30.47 .09	43.8 1.2	39.40 .32	88.8 2.6
27.1	10.60 .04	39.6 +0.2	21.81 .19	54.3 2.5	30.39 .07	42.6 1.2	39.11 .25	86.0 3.0
Sept. 6.1	10.57 −.01	39.5 0.0	21.65 −.13	51.7 +2.7	30.34 −.04	41.4 +1.2	38.91 −.17	82.8 −3.3
16.0	10.57 +.02	39.7 −0.2	21.56 −.05	49.0 2.7	30.32 .00	40.2 1.1	38.78 −.08	79.4 3.5
26.0	10.61 .05	40.0 0.4	21.56 +.04	46.3 2.7	30.34 +.04	39.2 0.9	38.74 +.01	75.8 3.7
Oct. 6.0	10.68 .09	40.6 0.7	21.64 .13	43.7 2.5	30.40 .08	38.4 0.7	38.80 .11	72.1 3.7
15.9	10.80 .13	41.4 1.0	21.82 .22	41.2 2.3	30.50 .13	37.9 0.4	38.97 .22	68.4 3.7
25.9	10.95 +.18	42.5 −1.2	22.08 +.31	39.1 +1.9	30.66 +.18	37.7 +0.1	39.24 +.32	64.6 −3.7
Nov. 4.9	11.15 .22	43.9 1.5	22.43 .39	37.4 1.5	30.86 .22	37.8 −0.3	39.61 .43	61.0 3.5
14.9	11.39 .25	45.5 1.7	22.86 .46	36.1 1.0	31.10 .26	38.3 0.7	40.09 .52	57.6 3.2
24.8	11.66 .29	47.3 1.9	23.35 .52	35.4 +0.4	31.39 .30	39.2 1.0	40.66 .61	54.6 2.9
Dec. 4.8	11.96 .31	49.3 2.1	23.90 .56	35.3 −0.2	31.70 .33	40.4 1.4	41.31 .68	51.9 2.4
14.8	12.28 +.32	51.4 −2 1	24.47 +.58	35.8 −0.8	32.04 +.34	42.0 −1.7	42.03 +.74	49.7 −1.9
24.8	12.61 .33	53.5 2.1	25.05 .58	36.8 1.3	32.39 .35	43.8 2.0	42.79 .77	48.0 1.3
34.7	12.94 +.32	55.7 −2.0	25.63 +.56	38.5 −1.9	32.73 +.34	45.9 −2.2	43.57 +.78	47.0 −0.7

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	32g Camelop. (H.)		α Can. Venaticorum.		θ Virginis.		α Virginis. (*Spica*.)	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*
	h m 12 48	° ′ +84 0	h m 12 50	° ′ +38 54	h m 13 4	° ′ — 4 56	h m 13 19	° ′ —10 34
	s	″	s	″	s	″	s	″
Jan. 0.8	13.92+2.23	63.7 −0.8	46.18 +.39	76.4 −1.9	8.15 +.33	20.4 −2.1	16.60 +.33	26.4 −2.0
10.7	16.17 2.24	63.3 −0.2	46.57 .39	74.7 1.4	8.48 .32	22.5 2.0	16.93 .33	28.4 2.0
20.7	18.40 2.18	63.4 +0.5	46.95 .37	73.6 0.9	8.79 .31	24.5 2.0	17.25 .32	30.4 2.0
30.7	20.53 2.05	64.2 1.1	47.30 .34	73.0 −0.3	9.09 .28	26.4 1.8	17.56 .30	32.4 1.9
Feb. 9.6	22.49 1.83	65.7 1.7	47.63 .30	73.0 +0.2	9.36 .26	28.1 1.6	17.84 .27	34.2 1.8
19.6	24.20+1.56	67.7 +2.2	47.91 +.26	73.4 +0.7	9.60 +.22	29.6 −1.4	18.09 +.24	35.9 −1.6
29.6	25.60 1.23	70.1 2.6	48.15 .21	74.4 1.1	9.81 .19	30.8 1.1	18.31 .20	37.4 1.4
Mar. 10.6	26.65 .86	72.9 2.9	48.34 .16	75.7 1.5	9.98 .15	31.8 0.8	18.50 .16	38.7 1.2
20.5	27.33 .48	76.0 3.1	48.48 .11	77.4 1.9	10.11 .11	32.5 0.6	18.64 .13	39.7 0.9
30.5	27.61+ .09	79.1 3.1	48.57 .06	79.4 2.0	10.21 .08	33.0 0.4	18.75 .10	40.5 0.7
Apr. 9.5	27.51− .29	82.2 +3.1	48.60 +.02	81.5 +2.2	10.27 +.05	33.3 −0.2	18.83 +.06	41.1 −0.5
19.5	27.03 .65	85.2 2.9	48.60 −.02	83.7 2.2	10.30 +.02	33.4 0.0	18.88 .03	41.5 0.3
29.4	26.20 .98	88.0 2.6	48.56 .06	85.9 2.1	10.31 −.01	33.3 +0.2	18.90 +.01	41.7 −0.1
May 9.4	25.07 1.26	90.4 2.2	48.48 .09	88.0 2.0	10.29 .03	33.0 0.3	18.90 −.01	41.8 0.0
19.4	23.68 1.49	92.5 1.8	48.38 .11	89.9 1.8	10.25 .05	32.6 0.4	18.87 .04	41.7 +0.2
29.4	22.08−1.68	94.0 +1.3	48.26 −.13	91.6 +1.5	10.19 −.07	32.2 +0.5	18.82 −.06	41.5 +0.3
June 8.3	20.33 1.80	95.0 0.7	48.11 .15	93.0 1.2	10.11 .08	31.6 0.5	18.75 .08	41.2 0.4
18.3	18.48 1.87	95.5 +0.2	47.96 .16	94.0 0.9	10.02 .09	31.1 0.6	18.67 .09	40.7 0.5
28.3	16.59 1.89	95.4 −0.4	47.79 .17	94.7 0.5	9.92 .10	30.5 0.6	18.57 .10	40.2 0.5
July 8.2	14.70 1.87	94.7 0.9	47.63 .17	95.1 +0.1	9.82 .11	29.8 0.6	18.46 .11	39.6 0.6
18.2	12.86−1.79	93.5 −1.5	47.46 −.16	95.0 −0.2	9.70 −.11	29.2 +0.6	18.34 −.12	39.0 +0.6
28.2	11.12 1.67	91.8 1.9	47.30 .16	94.6 0.6	9.59 .11	28.6 0.6	18.22 .12	38.4 0.7
Aug. 7.2	9.51 1.52	89.6 2.4	47.15 .14	93.8 1.0	9.48 .11	28.0 0.5	18.10 .12	37.7 0.6
17.1	8.08 1.33	87.0 2.8	47.01 .13	92.6 1.3	9.37 .10	27.5 0.5	17.99 .11	37.1 0.6
27.1	6.86 1.11	84.0 3.1	46.89 .10	91.1 1.7	9.28 .08	27.1 0.4	17.88 .09	36.5 0.6
Sept. 6.1	5.87− .85	80.7 −3.4	46.81 −.07	89.2 −2.1	9.21 −.06	26.8 +0.2	17.80 −.07	36.0 +0.5
16.1	5.14 .58	77.2 3.7	46.75 −.04	87.0 2.3	9.16 −.03	26.7 0.0	17.73 .04	35.6 0.4
26.0	4.71− .28	73.4 3.8	46.73 +.01	84.5 2.6	9.15 .00	26.7 −0.2	17.71 −.01	35.3 +0.2
Oct. 6.0	4.57+ .03	69.6 3.9	46.76 .05	81.8 2.8	9.17 +.04	27.0 0.4	17.71 +.03	35.2 0.0
16.0	4.76 .35	65.7 3.8	46.84 .10	78.9 3.0	9.24 .09	27.5 0.6	17.76 .07	35.4 −0.3
25.9	5.28+ .68	61.9 −3.7	46.97 +.15	75.8 −3.1	9.35 +.13	28.3 −0.9	17.86 +.12	35.8 −0.5
Nov. 4.9	6.11 1.01	58.3 3.5	47.15 .21	72.7 3.1	9.50 .18	29.3 1.2	18.01 .17	36.5 0.8
14.9	7.29 1.32	54.8 3.2	47.38 .26	69.6 3.1	9.70 .22	30.6 1.4	18.20 .21	37.5 1.1
24.9	8.75 1.60	51.8 2.9	47.66 .30	66.5 3.0	9.94 .26	32.2 1.7	18.43 .25	38.7 1.4
Dec. 4.8	10.49 1.85	49.1 2.4	47.98 .34	63.6 2.8	10.22 .29	34.0 1.9	18.70 .29	40.2 1.6
14.8	12.45+2.05	47.0 −1.8	48.34 +.37	61.0 −2.5	10.53 +.31	35.9 −2.0	19.01 +.31	41.9 −1.8
24.8	14.58 2.16	45.4 1.2	48.72 .39	58.6 2.1	10.85 .33	38.0 2.1	19.33 .33	43.8 2.0
34.8	16.81+2.25	44.5 −0.6	49.12 +.39	56.7 −1.7	11.18 +.34	40.1 −2.0	19.66 +.34	45.8 −2.1

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ζ Virginis.		η Ursæ Majoris.		η Bootis.		β Centauri.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	h m 13 28	° ′ − 0 1	h m 13 43	° ′ +49 51	h m 13 49	° ′ +18 57	h m 13 55	° ′ −59 49
	s	″	s	″	s	″	s	″
Jan. 0.8	58.10 +.32	17.2 −2.1	6.02 +.42	72.1 −2.2	19.83 +.33	33.8 −2.4	54.01 +.55	32.7 −0.5
10.8	58.42 .32	19.3 2.0	6.45 .44	70.1 1.7	20.16 .33	31.5 2.0	54.57 .56	33.4 1.0
20.7	58.74 .31	21.2 1.9	6.89 .43	68.7 1.1	20.50 .33	29.7 1.7	55.13 .55	34.7 1.5
30.7	59.05 .30	23.0 1.7	7.32 .42	67.9 −0.5	20.82 .31	28.1 1.3	55.67 .53	36.3 1.9
Feb. 9.7	59.34 .27	24.6 1.4	7.73 .39	67.7 +0.1	21.13 .29	27.0 0.9	56.18 .49	38.4 2.2
19.7	59.59 +.24	25.9 −1.2	8.10 +.35	68.1 +0.7	21.41 +.27	26.3 −0.5	56.65 +.44	40.8 −2.5
29.6	59.82 .21	26.9 0.9	8.43 .31	69.1 1.3	21.66 .23	26.1 0.0	57.08 .40	43.5 2.7
Mar. 10.6	60.01 .17	27.6 0.6	8.72 .25	70.6 1.7	21.87 .20	26.3 +0.4	57.45 .34	46.3 2.9
20.6	60.16 .14	28.1 0.3	8.94 .20	72.6 2.1	22.05 .16	26.8 0.7	57.76 .28	49.3 3.0
30.5	60.28 .10	28.3 −0.1	9.11 .14	74.8 2.4	22.19 .12	27.7 1.0	58.01 .22	52.3 3.0
Apr. 9.5	60.36 +.07	28.2 +0.2	9.22 +.08	77.4 +2.6	22.29 +.09	28.8 +1.2	58.21 +.16	55.3 −3.0
19.5	60.42 .04	28.0 0.3	9.27 +.03	80.1 2.7	22.36 .05	30.1 1.4	58.34 .10	58.3 2.9
29.5	60.44 +.01	27.5 0.5	9.28 −.02	82.8 2.7	22.40 +.02	31.6 1.5	58.41 +.04	61.2 2.8
May 9.4	60.45 −.01	27.0 0.6	9.23 .07	85.4 2.6	22.41 −.01	33.2 1.5	58.43 −.02	63.8 2.6
19.4	60.42 .03	26.4 0.7	9.14 .11	87.9 2.3	22.39 .03	34.7 1.5	58.38 .07	66.3 2.3
29.4	60.38 −.05	25.7 +0.7	9.01 −.14	90.1 +2.1	22.35 −.05	36.2 +1.4	58.28 −.12	68.5 −2.0
June 8.4	60.32 .07	25.0 0.7	8.85 .17	92.0 1.7	22.28 .07	37.6 1.3	58.14 .17	70.4 1.7
18.3	60.24 .09	24.3 0.7	8.66 .20	93.5 1.3	22.20 .09	38.8 1.1	57.94 .22	71.8 1.3
28.3	60.14 .10	23.6 0.7	8.45 .22	94.7 0.9	22.10 .11	39.9 0.9	57.70 .26	73.0 0.9
July 8.3	60.04 .11	22.9 0.6	8.22 .23	95.4 +0.5	21.98 .12	40.7 0.7	57.42 .29	73.7 −0.5
18.2	59.92 −.12	22.3 +0.6	7.98 −.24	95.6 0.0	21.85 −.13	41.3 +0.5	57.10 −.31	74.0 0.0
28.2	59.80 .12	21.8 0.5	7.74 .24	95.4 −0.4	21.72 .14	41.6 +0.2	56.79 .33	73.8 +0.4
Aug. 7.2	59.68 .12	21.4 0.4	7.50 .23	94.7 0.9	21.58 .14	41.7 −0.1	56.46 .33	73.2 0.8
17.2	59.57 .11	21.0 0.3	7.27 .22	93.6 1.4	21.44 .13	41.5 0.3	56.13 .32	72.1 1.2
27.1	59.46 .10	20.8 +0.1	7.06 .20	92.0 1.8	21.31 .12	41.0 0.6	55.82 .29	70.7 1.6
Sept. 6.1	59.37 −.08	20.8 0.0	6.87 −.17	90.1 −2.2	21.20 −.10	40.2 −0.9	55.55 −.26	68.9 +1.9
16.1	59.30 .05	20.9 −0.2	6.72 .13	87.7 2.5	21.10 .08	39.2 1.2	55.32 .20	66.8 2.2
26.1	59.26 −.02	21.2 0.4	6.60 .09	85.0 2.9	21.04 .05	37.9 1.5	55.16 .13	64.5 2.3
Oct. 6.0	59.26 +.02	21.8 0.6	6.54 −.04	82.0 3.1	21.01 −.01	36.3 1.7	55.06 −.05	62.1 2.4
16.0	59.30 .06	22.6 0.9	6.53 +.02	78.7 3.4	21.02 +.03	34.4 2.0	55.06 +.04	59.7 2.4
26.0	59.38 +.11	23.6 −1.2	6.58 +.08	75.2 −3.5	21.08 +.08	32.3 −2.2	55.14 +.13	57.4 +2.2
Nov. 4.9	59.51 .15	24.9 1.4	6.69 .15	71.7 3.6	21.18 .13	29.9 2.4	55.31 .22	55.3 2.0
14.9	59.69 .20	26.4 1.6	6.87 .21	68.1 3.5	21.34 .18	27.4 2.6	55.57 .30	53.4 1.7
24.9	59.91 .24	28.2 1.8	7.12 .27	64.6 3.4	21.54 .22	24.8 2.7	55.91 .38	51.9 1.3
Dec. 4.9	60.17 .27	30.1 2.0	7.42 .33	61.2 3.2	21.78 .26	22.1 2.7	56.33 .45	50.9 0.8
14.8	60.46 +.30	32.2 −2.1	7.78 +.38	58.1 −2.9	22.06 +.29	19.4 −2.6	56.81 +.50	50.3 +0.3
24.8	60.77 .32	34.3 2.1	8.18 .41	55.4 2.5	22.37 .32	16.9 2.5	57.33 .54	50.3 −0.2
34.8	61.09 +.32	36.4 −2.1	8.60 +.43	53.1 −2.1	22.70 +.33	14.5 −2.2	57.88 +.56	50.7 −0.7

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Draconis.		α Bootis. (*Arcturus.*)		θ Bootis.		ρ Bootis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	14 1	+64 54	14 10	+19 45	14 21	+52 21	14 26	+30 51
	s	″	s	″	s	″	s	″
Jan. 0.8	19.13 +.57	30.1 −2.3	31.78 +.32	56.9 −2.5	21.15 +.41	59.5 −2.6	58.67 +.32	45.3 −2.6
10.8	19.72 .60	28.1 1.6	32.10 .32	54.6 2.2	21.57 .44	57.1 2.1	59.00 .34	42.9 2.2
20.8	20.33 .61	26.8 1.0	32.43 .33	52.6 1.8	22.02 .45	55.3 1.5	59.35 .35	40.9 1.8
30.7	20.94 .60	26.1 −0.3	32.76 .32	50.9 1.4	22.47 .44	54.1 0.9	59.70 .34	39.3 1.3
Feb. 9.7	21.53 .57	26.1 +0.3	33.07 .30	49.7 1.0	22.91 .43	53.6 −0.2	60.03 .33	38.2 0.8
19.7	22.08 +.52	26.7 +1.0	33.36 +.27	48.9 −0.6	23.32 +.40	53.7 +0.4	60.35 +.31	37.7 −0.3
29.6	22.58 .46	28.0 1.4	33.62 .25	48.5 −0.1	23.70 .36	54.4 1.0	60.64 .27	37.7 +0.3
Mar. 10.6	23.00 .39	29.8 2.0	33.85 .21	48.6 +0.3	24.03 .31	55 6 1.5	60.90 .24	38.2 0.7
20.6	23.35 .31	32.1 2.4	34.04 .18	49.1 0.7	24.32 .26	57.4 2.0	61.13 .20	39.2 1.2
30.6	23.62 .22	34.7 2.8	34.20 .14	49.9 1.0	24.54 .20	59.6 2.4	61.31 .17	40.6 1.5
Apr. 9.5	23.79 +.13	37.6 +3.0	34.33 +.11	51.0 +1.2	24.71 +.14	62.1 +2.6	61.46 +.13	42.3 +1.8
19.5	23.88 +.04	40.6 3.0	34.42 .07	52.4 1.4	24.82 .08	64.9 2.8	61.57 .09	44.2 2.0
29.5	23.87 −.04	43.7 3.0	34.47 .04	53.9 1.5	24.88 +.03	67.7 2.8	61.64 .05	46.4 2.2
May 9.5	23.79 .12	46.6 2.9	34.50 +.01	55.5 1.6	24.87 −.03	70.5 2.8	61.68 +.02	48.5 2.2
19.4	23.63 .19	49.4 2.6	34.50 −.02	57.1 1.6	24.82 .08	73.2 2.6	61.68 −.01	50.7 2.1
29.4	23.41 −.25	51.9 +2.3	34.47 −.04	58.7 +1.5	24.72 −.12	75.8 +2.4	61.65 −.04	52.8 +2.0
June 8.4	23.12 .31	54.0 1.9	34.41 .07	60.1 1.4	24.58 .16	78.0 2.1	61.59 .07	54.7 1.8
18.3	22.80 .35	55.7 1.5	34.33 .09	61.4 1.2	24.40 .20	79.9 1.7	61.50 .10	56.4 1.6
28.3	22.43 .38	56.9 1.0	34.24 .11	62.5 1.0	24.19 .23	81.5 1.3	61.39 .12	57.9 1.3
July 8.3	22.03 .41	57.6 +0.5	34.12 .12	63.4 0.8	23.95 .25	82.5 0.9	61.26 .14	59.0 1.0
18.3	21.61 −.42	57.9 0.0	33.99 −.14	64.1 +0.5	23.69 −.27	83.2 +0.4	61.11 −.16	59.9 +0.7
28.2	21.19 .42	57.6 −0.6	33.85 .15	64.5 +0.3	23.42 .28	83.3 −0.1	60.94 .17	60.3 +0.3
Aug. 7.2	20.76 .42	56.7 1.1	33.70 .15	64.6 0.0	23.14 .28	83.0 0.6	60.77 .18	60.4 −0.1
17.2	20.35 .40	55.4 1.5	33.55 .15	64.5 −0.3	22.86 .27	82.2 1.0	60.59 .18	60.2 0.4
27.2	19.97 .37	53.6 2.0	33.41 .14	64.0 0.6	22.59 .26	80.9 1.5	60.42 .17	59.5 0.8
Sept. 6.1	19.62 −.33	51.4 −2.4	33.27 −.12	63.2 −0.9	22.34 −.23	79.2 −1.9	60.26 −.15	58.5 −1.2
16.1	19.32 .27	48.7 2.9	33.16 .10	62.2 1.2	22.12 .20	77.0 2.4	60.11 .13	57.2 1.5
26.1	19.07 .21	45.7 3.2	33.07 .07	60.8 1.5	21.94 .16	74.4 2.7	60.00 .10	55.4 1.9
Oct. 6.0	18.90 .14	42.3 3.5	33.02 −.03	59.2 1.8	21.80 .11	71.5 3.1	59.91 .06	53.4 2.2
16.0	18.80 −.05	38.7 3.7	33.00 +.01	57.2 2.0	21.72 −.05	68.3 3.3	59.87 −.02	51.0 2.5
26.0	18.79 +.05	35.0 −3.8	33.03 +.06	55.1 −2.3	21.70 +.01	64.9 −3.5	59.87 +.03	48.4 −2.7
Nov. 5.0	18.87 .13	31.1 3.8	33.11 .10	52.7 2.5	21.75 .07	61.3 3.7	59.93 .08	45.5 2.9
14.9	19.05 .22	27.3 3.8	33.24 .15	50.1 2.6	21.87 .15	57.6 3.7	60.04 .14	42.5 3.1
24.9	19.32 .31	23.5 3.6	33.42 .20	47.4 2.7	22.06 .22	53.9 3.6	60.21 .19	39.4 3.1
Dec. 4.9	19.69 .40	20.0 3.4	33.65 .24	44.6 2.8	22.32 .29	50.3 3.5	60.42 .24	36.3 3.1
14.9	20.13 +.48	16.8 −3.0	33.91 +.28	41.8 −2.7	22.64 +.34	46.9 −3.2	60.69 +.28	33.2 −3.0
24.8	20.64 .54	13.9 2.6	34.21 .31	39.1 2.6	23.01 .39	43.8 2.9	60.98 .31	30.3 2.8
34.8	21.21 +.59	11.6 −2.0	34.52 +.32	36.6 −2.4	23.42 +.43	41.2 −2.4	61.31 +.34	27.7 −2.5

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	5 Ursæ Minoris.		a^2 Centauri.		ε Bootis.		a^2 Libræ.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	h m 14 27	° ′ +76 11	h m 14 31	° ′ −60 22	h m 14 40	° ′ +27 32	h m 14 44	° ′ −15 34
	s	″	s	″	s	″	s	″
Jan. 0.8	42.19 +.85	27.9 −2.4	59.12 +.53	9.0 0.0	4.19 +.31	46.7 −2.6	39.46 +.32	21.8 −1.5
10.8	43.10 .94	25.8 1.8	59.67 .55	9.2 −0.5	4.51 .33	44.3 2.3	39.79 .32	23.4 1.6
20.8	44.08 .99	24.3 1.1	60.22 .55	10.0 1.0	4.85 .34	42.2 1.9	40.11 .33	25.1 1.7
30.7	45.08 1.00	23.5 −0.5	60.78 .54	11.2 1.4	5.19 .33	40.5 1.4	40 44 .32	26.7 1.6
Feb. 9.7	46.08 .98	23.4 +0.2	61.31 .52	12.8 1.8	5.52 .32	39.3 0.9	40.76 .31	28.4 1.6
19.7	47.04 +.92	24.0 +0.9	61.82 +.49	14.7 −2.1	5.83 +.30	38.6 −0.4	41.06 +.29	29.9 −1.5
29.7	47.92 .84	25.1 1.5	62.29 .44	17.0 2.4	6.13 .28	38.4 +0.1	41.34 .27	31.3 1.3
Mar. 10.6	48.71 .72	26.9 2.0	62.71 .40	19.4 2.6	6.39 .25	38.8 0.5	41.59 .24	32.6 1.2
20.6	49.37 .58	29.2 2.5	63.08 .34	22.1 2.7	6.62 .21	39.5 1.0	41.82 .21	33.7 1.0
30.6	49.88 .44	31.8 2.8	63.40 .29	24.9 2.8	6.81 .18	40.7 1.4	42.02 .18	34.6 0.8
Apr. 9.6	50.24 +.28	34.8 +3.0	63.66 +.23	27.7 −2.8	6.97 +.14	42.3 +1.7	42.19 +.15	35.3 −0.6
19.5	50.43 +.12	37.9 3.1	63.85 .17	30.6 2.8	7.09 .10	44.1 1.9	42.32 .12	35.9 0.5
29.5	50.47 −.04	41.0 3.1	63.99 .11	33.3 2.7	7.18 .07	46.0 2.0	42.43 .09	36.3 0.3
May 9.5	50.35 .19	44.1 3.0	64.06 +.05	36.0 2.6	7.23 +.04	48.1 2.1	42.51 .06	36.5 0.2
19.4	50.08 .33	47.0 2.8	64.08 −.02	38.6 2.4	7.25 .00	50.2 2.1	42.56 .04	36.7 −0.1
29.4	49.68 −.46	49.7 +2.5	64.03 −.07	40.9 −2.2	7.24 −.03	52.2 +2.0	42.58 +.01	36.7 0.0
June 8.4	49.16 .57	52.0 2.1	63.93 .13	43.0 2.0	7.20 .06	54.1 1.8	42.58 −.02	36.6 +0.1
18.4	48.53 .67	53.8 1.6	63.77 .19	44.8 1.7	7.12 .08	55.8 1.6	42.54 .05	36.5 0.2
28.3	47.83 .74	55.2 1.1	63.55 .24	46.3 1.3	7.03 .11	57.3 1.3	42.48 .07	36.3 0.2
July 8.3	47.05 .80	56.1 0.6	63.29 .28	47.4 0.9	6.91 .13	58.5 1.1	42.40 .10	36.0 0.3
18.3	46.23 −.83	56.5 +0.1	62.99 −.32	48.0 −0.4	6.77 −.15	59.4 +0.7	42.29 −.12	35.7 +0.4
28.3	45.38 .85	56.4 −0.4	62.66 .34	48.2 0.0	6.61 .16	60.0 0.4	42.17 .13	35.3 0.4
Aug. 7.2	44.53 .84	55.7 0.9	62.30 .36	48.0 +0.4	6.44 .17	60.3 +0.1	42.03 .14	34.8 0.5
17.2	43.70 .82	54.5 1.5	61.95 .35	47.4 0.8	6.27 .17	60.1 −0.3	41.88 .15	34.3 0.5
27.2	42.90 .77	52.8 1.9	61.60 .34	46.3 1.3	6.10 .17	59.7 0.6	41.73 .15	33.8 0.5
Sept. 6.1	42.15 −.71	50.6 −2.4	61.26 −.31	44.9 +1.6	5.94 −.16	58.9 −1.0	41.58 −.14	33.3 +0.5
16.1	41.67 .63	48.0 2.8	60.98 .25	43.1 1.9	5.79 .14	57.7 1.3	41.46 .12	32.9 0.4
26.1	40.90 .52	45.0 3.2	60.74 .21	41.0 2.1	5.66 .11	56.2 1.7	41.35 .09	32.5 0.3
Oct. 6.1	40.43 .40	41.6 3.5	60.57 .13	38.8 2.3	5.57 .07	54.4 2.0	41.28 .05	32.2 0.2
16.0	40.09 .27	38.0 3.7	60.48 −.04	36.4 2.3	5.52 −.03	52.2 2.3	41.24 −.01	32.0 +0.1
26.0	39.89 −.12	34.3 −3.8	60.49 +.05	34.1 +2.3	5.51 +.02	49.8 −2.6	41.26 +.04	32.0 −0.1
Nov. 5.0	39.85 +.02	30.4 3.8	60.58 .14	31.8 2.2	5.56 .07	47.1 2.8	41.32 .09	32.3 0.3
15.0	39.98 .21	26.5 3.8	60.77 .23	29.8 1.9	5.66 .12	44.2 2.9	41.43 .14	32.7 0.6
24.9	40.27 .37	22.7 3.7	61.05 .32	28.0 1.6	5.81 .17	41.2 3.0	41.60 .19	33.4 0.8
Dec. 4.9	40.73 .53	19.0 3.5	61.41 .40	26.6 1.2	6.01 .22	38.2 3.0	41.81 .23	34.3 1.1
14.9	41.33 +.67	15.7 −3.1	61.84 +.46	25.6 +0.7	6.25 +.26	35.2 −2.9	42.06 +.27	35.6 −1.3
24.8	42.07 .80	12.8 2.7	62.33 .51	25.1 +0.3	6.54 .30	32.3 2.7	42.35 .30	36.9 1.5
34.8	42.93 +.91	10.3 −2.1	62.86 +.54	25.1 0.0	6.85 +.32	29.6 −2.5	42.66 +.32	38.5 −1.7

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	β Ursæ Minoris.		β Bootis.		β Libræ.		u^1 Bootis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*
	h m 14 50	° ′ +74 36	h m 14 57	° ′ +40 49	h m 15 10	° ′ − 8 57	h m 15 20	° ′ +37 45
	s	″	s	″	s	″	s	″
Jan. 0.8	58.38 +.73	38.8 −2.6	41.79 +.33	53.4 −2.9	57.20 +.29	59.7 −1.7	13.68 +.30	70.9 −2.9
10.8	59.16 .81	36.4 2.1	42.14 .35	50.8 2.4	57.50 .31	61.4 1.7	14.00 .33	68.1 2.6
20.8	60.01 .87	34.6 1.5	42.50 .37	48.6 2.0	57.81 .32	63.1 1.7	14.34 .35	65.7 2.1
30.8	60.91 .90	33.4 0.8	42.88 .37	46.9 1.4	58.13 .31	64.7 1.6	14.70 .36	63.8 1.6
Feb. 9.7	61.81 .90	33.0 −0.1	43.25 .36	45.7 0.8	58.44 .30	66.2 1.4	15.05 .35	62.5 1.1
19.7	62.70 +.86	33.2 +0.5	43.61 +.35	45.2 −0.2	58.74 +.29	67.6 −1.3	15.41 +.34	61.7 −0.5
29.7	63.53 .80	34.1 1.2	43.95 .32	45.2 +0.3	59.03 .27	68.8 1.1	15.74 .32	61.5 +0.1
Mar. 10.7	64.29 .71	35.5 1.7	44.25 .29	45.9 0.9	59.29 .25	69.7 0.8	16.05 .30	61.9 0.6
20.6	64.94 .60	37.5 2.2	44.53 .25	47.0 1.4	59.53 .23	70.5 0.6	16.33 .26	62.8 1.2
30.6	65.48 .47	40.0 2.6	44.76 .21	48.7 1.9	59.75 .20	71.0 0.4	16.58 .23	64.2 1.6
Apr. 9.6	65.88 +.33	42.8 +2.9	44.95 +.17	50.7 +2.2	59.93 +.17	71.3 −0.2	16.79 +.19	66.0 +2.0
19.5	66.14 .19	45.9 3.1	45.10 .13	53 0 2 4	60.09 .14	71.4 0.0	16.96 .15	68.2 2.3
29.5	66.26 +.05	49.0 3.1	45.21 .08	55.5 2.6	60.22 .12	71.3 +0.1	17.09 .11	70.6 2.5
May 9.5	66.23 −.09	52.2 3.1	45.27 +.04	58.1 2.6	60.33 .09	71.2 0.2	17.18 .07	73.1 2.6
19.5	66.07 .22	55.2 2.9	45.29 .00	60.7 2.6	60.40 .06	70.9 0.3	17.23 +.03	75.7 2.6
29.4	65.78 −.34	58.0 +2.7	45.27 −.04	63.3 +2.4	60.44 +.03	70.5 +0.4	17.23 −.01	78.2 +2.5
June 8.4	65.38 .46	60.5 2.3	45.21 .08	65.6 2.2	60.46 .00	70.1 0.4	17.21 .05	80.7 2.3
18.4	64.87 .55	62.7 1.9	45.12 .11	67.7 2.0	60.45 −.03	69.6 0.5	17.14 .08	82.9 2.1
28.4	64.28 .63	64.4 1.5	44.99 .14	69.5 1.7	60.40 .06	69.1 0.5	17.04 .12	84.8 1.8
July 8.3	63.61 .69	65.6 1.0	44.83 .17	71.0 1.3	60.33 .08	68.7 0.5	16.91 .15	86.4 1.5
18.3	62.89 −.74	66.3 +0.5	44.65 −.19	72.1 +0.9	60.24 −.11	68.2 +0.4	16.75 −.17	87.7 +1.1
28.3	62.14 .77	66.5 −0.1	44.45 .21	72.8 +0.5	60.12 .13	67.8 0.4	16.56 .19	88.6 0.7
Aug. 7.2	61.36 .78	66.2 0.6	44.24 .22	73.0 0.0	59.98 .14	67.3 0.4	16.36 .21	89.1 +0.3
17.2	60.58 .77	65.3 1.1	44.01 .22	72.8 −0.4	59.84 .15	66.9 0.4	16.14 .22	89.2 −0.1
27.2	59.82 .74	64.0 1.6	43.79 .22	72.2 0.8	59.68 .15	66.6 0.3	15.92 .22	88.9 0.6
Sept. 6.2	59.10 −.69	62.1 −2.1	43.57 −.21	71.1 −1.3	59.53 −.14	66.3 +0.2	15.70 −.21	88.1 −1.0
16.1	58.43 .63	59.8 2.5	43.37 .19	69.7 1.7	59.40 .13	66.1 +0.1	15.50 .20	86.9 1.4
26.1	57.84 .54	57.0 2.9	43.20 .16	67.8 2.1	59.27 .11	66.1 0.0	15.31 .17	85.3 1.8
Oct. 6.1	57.35 .44	53.9 3.3	43.05 .12	65.5 2 5	59.18 .08	66.1 −0.1	15.16 .14	83.3 2.2
16.1	56.96 .32	50.5 3.5	42.96 .07	62.8 2.8	59.12 −.04	66.3 0.3	15.04 .09	80.9 2.5
26.0	56.70 −.19	46.8 −3.7	42.91 −.02	59.9 −3.1	59.11 +.01	66.7 −0.5	14.97 −.04	78.2 −2.8
Nov. 5.0	56.58 −.05	43.0 3.9	42.92 +.04	56.7 3.3	59.14 .06	67.3 0.7	14.95 +.01	75.2 3.1
15.0	56.61 +.10	39.1 3.9	42.98 .10	53.4 3.4	59 23 .11	68.1 0.9	14.99 .07	72.0 3.3
24.9	56.78 .26	35.2 3.8	43.11 .16	49.9 3.5	59.36 .16	69.2 1.1	15.09 .13	68.7 3.4
Dec. 4.9	57.12 .40	31.5 3.6	43.30 .21	46.4 3.4	59.54 .20	70.4 1.3	15.25 .18	65.3 3.4
14.9	57.59 +.54	28.0 −3.3	43.54 +.26	43.1 −3.3	59.77 +.24	71.8 −1.5	15.46 +.24	61.9 −3.3
24.9	58.20 .67	24.8 2.9	43.83 .31	39.9 3.1	60.03 .28	73.4 1.6	15.72 .28	58.7 3.1
34.8	58.93 +.78	22.1 −2.4	44.16 + 34	37.0 −2.8	60.32 +.30	75.1 −1.7	16.02 +.32	55.7 −2 8

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	γ^2 Ursæ Minoris.		α Coronæ Borealis.		α Serpentis.		ϵ Serpentis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 15 20	+72° 13′	h m 15 29	+27° 5′	h m 15 38	+ 6° 46′	h m 15 45	+ 4° 48′
	s	″	s	″	s	″	s	″
Jan. 0.9	50.94 +.57	50.1 −3.0	54.97 +.28	31.4 −2.8	43.35 +.26	47.4 −2.2	12.24 +.26	61.2 −2.1
10.8	51.57 .67	47.4 2.4	55.26 .30	28.7 2.5	43.62 .29	45.3 2.1	12.51 .28	59.1 2.0
20.8	52.28 .73	45.2 1.9	55.57 .32	26.4 2.2	43.92 .30	43.3 1.9	12.80 .30	57.2 1.8
30.8	53.04 .77	43.6 1.3	55.90 .33	24.4 1.7	44.22 .31	41.5 1.7	13.11 .30	55.4 1.6
Feb. 9.8	53.83 .79	42.7 −0.6	56.23 .33	22.9 1.3	44.53 .30	39.9 1.4	13.41 .30	53.9 1.4
19.7	54.61 +.77	42.5 +0.1	56.55 +.31	21.9 −0.7	44.83 +.30	38.7 −1.0	13.71 +.29	52.6 −1.1
29.7	55.37 .73	42.9 0.8	56.86 .30	21.4 −0.2	45.12 .28	37.8 0.7	14.00 .26	51.7 0.7
Mar. 10.7	56.08 .67	44.0 1.4	57.15 .28	21.4 +0.3	45.40 .26	37.3 −0.3	14.28 .27	51.2 −0.4
20.6	56.71 .59	45.7 1.9	57.41 .25	21.9 0.8	45.65 .24	37.2 0.0	14.53 .24	51.0 0.0
30.6	57.25 .49	47.9 2.4	57 65 .22	22.9 1.2	45.88 .22	37.4 +0.3	14.77 .22	51.1 +0.3
Apr. 9.6	57.69 +.38	50.4 +2.7	57.85 +.19	24.3 +1.6	46.08 +.19	37.9 +0.6	14.97 +.20	51.5 +0.6
19.6	58.01 .26	53.4 3.0	58.03 .15	26.1 1.8	46 26 .16	38.7 0.9	15.16 .17	52.2 0 8
29.5	58.21 .14	56.5 3.1	58.17 .12	28.0 2.0	46.40 .13	39.6 1.1	15.31 .14	53.1 1.0
May 9.5	58.28 +.02	59.6 3.2	58.27 .09	30.1 2.2	46.53 .11	40.8 1.2	15.44 .11	54.1 1.1
19.5	58.24 −.10	62.8 3.1	58.34 .05	32.3 2.2	46.62 .08	42.0 1.3	15.54 .08	55.3 1.2
29.5	58.08 −.21	65.8 +2.9	58.37 +.02	31.5 +2.2	46.68 +.05	43.3 +1.3	15.61 +.05	56.5 +1.2
June 8.4	57.81 .32	68.5 2.6	58.37 −.02	36.7 2.1	46.71 +.01	44.6 1.3	15.64 +.02	57.7 1.2
18.4	57.45 .41	71.0 2.3	58.34 .05	38.7 1.9	46.71 −.02	45.9 1.2	15.65 −.01	58.9 1.1
28.4	56.99 .49	73.1 1.8	58.28 .08	40.4 1.7	46.67 .05	47.0 1.1	15.63 .04	60.0 1.0
July 8.3	56.46 .56	74.7 1.4	58.18 .11	42.0 1.4	46.61 .07	48.1 1.0	15.57 .07	61.0 0.9
18.3	55.86 −.62	75.9 +0.9	58.06 −.14	43.2 +1.1	46.53 −.10	49.0 +0.8	15.49 −.10	61.9 +0.8
28.3	55.22 .66	76.5 +0.4	57.91 .16	44.2 0.8	46.41 .12	49.7 0.7	15.38 .12	62.6 0.7
Aug. 7.3	54 55 .68	76.7 −0.1	57.74 .17	44.8 0.4	46.28 .14	50.3 0.5	15.24 .14	63.2 0.5
17.2	53.86 .69	76.3 0.7	57.56 .18	45.0 +0.1	46.13 .15	50.7 0.3	15.10 .15	63.6 0.3
27.2	53.17 .68	75.4 1.2	57.37 .19	45.0 −0.3	45.97 .16	50.9 +0.1	14.94 .16	63.8 +0.1
Sept. 6.2	52.50 −.65	74.0 −1.7	57.18 −.18	44.5 −0.6	45.81 −.16	50.9 −0.1	14.77 −.16	63.8 −0.1
16.2	51.86 .61	72.1 2.1	57.00 .17	43.6 1.0	45.65 .15	50.6 0.4	14.61 .15	63.6 0.3
26.1	51.28 .55	69.7 2.6	56.84 .15	42.4 1.4	45.51 .13	50.1 0.6	14.47 .13	63.2 0.5
Oct. 6.1	50.77 .47	66.9 3.0	56.70 .12	40.9 1.7	45.39 .10	49.4 0.8	14.35 .11	62.6 0.7
16.1	50.35 .37	63.7 3.3	56.60 .08	39.0 2.1	45.31 .07	48.4 1.1	14.26 .07	61.8 1.0
26.0	50.03 −.26	60.3 −3.6	56.54 −.04	36.7 −2.4	45.26 −.02	47.2 −1.3	14.21 −.03	60.7 −1.2
Nov. 5.0	49.83 −.13	56.6 3.8	56.53 +.01	34.2 2.6	45.26 +.02	45.8 1.6	14.21 +.02	59.3 1.4
15.0	49.76 .00	52.8 3.9	56.57 .06	31.5 2.8	45.31 .07	44.1 1.8	14.25 .07	57.8 1.7
25.0	49.83 +.13	48.9 3.9	56.66 .12	28.5 3.0	45.41 .12	42.2 2.0	14.34 .12	56.0 1.8
Dec. 4.9	50.03 .27	45.1 3.8	56.81 .17	25.5 3.1	45.55 .17	40.1 2.1	14.48 .16	54.1 2.0
14.9	50.36 +.40	41.4 −3.6	57.01 +.22	22.4 −3.0	45.74 +.21	38.0 −2.2	14.67 +.21	52.0 −2.1
24.9	50.83 .52	37.9 3.2	57.25 .26	19.5 2.9	45.98 .25	35.7 2.2	14.90 .24	49.9 2.1
34.9	51.40 +.64	34.9 −2.8	57.52 +.29	16.6 −2.7	46.24 +.28	33.5 −2.2	15 16 +.28	47.7 −2.1

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ζ Ursæ Minoris.		ε Coronæ Borealis.		δ Scorpii.		β¹ Scorpii.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*
	h m 15 47	° ′ +78 7	h m 15 52	° ′ +27 11	h m 15 53	° ′ −22 17	h m 15 58	° ′ −19 29
	s	″	s	″	s	″	s	″
Jan. 0.9	59.02+ .70	73.4 −3.1	55.22 +.26	70.2 −2.9	40.79 +.28	56.0 −0.8	53.61 +.27	42.5 −1.0
10.9	59.80 .86	70.6 2.6	55.49 .29	67.4 2.6	41.09 .31	56.9 1.0	53.90 .30	43.5 1.1
20.8	60.73 .98	68.2 2.1	55.79 .31	65.0 2.3	41.40 .32	58.0 1.1	54.21 32	44.6 1.2
30.8	61.76 1.06	66.3 1.5	56.11 .32	62.9 1.9	41.73 .33	59.2 1.2	54.53 .32	45.8 1.2
Feb. 9.8	62.86 1.11	65.2 0.9	56.43 .32	61.3 1.4	42.06 .33	60.3 1.2	54.85 .32	47.0 1.2
19.7	63.99+1.12	64.6 −0.2	56.76 +.32	60.1 −0.9	42.39 +.32	61.5 −1.2	55.17 +.32	48.2 −1.1
29.7	65.10 1.09	64.8 +0.5	57.07 .30	59.5 −0.4	42.70 .31	62.7 1.1	55.49 .31	49.2 1.0
Mar. 10.7	66.16 1.02	65.6 1.1	57.37 .29	59.4 +0.2	43.01 .29	63.7 1.0	55.79 .29	50.2 0.9
20.7	67.14 .92	67.0 1.7	57.64 .26	59.8 0.7	43.29 .27	64.7 0.9	56.07 .27	51.1 0.8
30.6	68.00 .78	69.0 2.2	57.90 .24	60.7 1.1	43.55 .25	65.6 0.8	56.33 .25	51.9 0.7
Apr. 9.6	68.71+ .63	71.4 +2.6	58.12 +.21	62.1 +1.5	43.79 +.22	66.3 −0 7	56.56 +.23	52.4 −0.6
19.6	69.26 .46	74.1 2.9	58.31 .18	63.7 1.8	44.00 .20	67.0 0.6	56.78 .20	53.0 0.5
29.6	69.63 .28	77.2 3.1	58.47 .15	65.7 2 0	44.19 .17	67.6 0.5	56.96 .17	53.4 0.3
May 9.5	69.82+ .10	80.3 3.2	58.60 .11	67.8 2.2	44.34 .14	68.0 0.4	57.12 .14	53.6 0.2
19.5	69.82− .09	83.5 3.1	58.70 .08	70.1 2.3	44.47 .11	68.4 0.4	57.25 .11	53.9 0.2
29.5	69.64− .26	86.6 +3.0	58.75 +.04	72.4 +2.3	44.56 +.08	68.8 −0.3	57.35 +.08	54.0 −0.1
June 8.4	69.30 .43	89.5 2.8	58.77 .00	74.6 2 2	44.62 .04	69.1 0.2	57.41 .05	54.1 −0.1
18.4	68.78 .58	92.1 2.5	58.76 −.03	76.7 2.0	44.65 +.01	69.3 0.2	57.44 +.01	54.2 0.0
28.4	68.13 .72	94.4 2.1	58.71 .07	78.6 1.8	44.63 −.03	69.4 0.1	57.43 −.02	54.2 0.0
July 8.4	67.35 .84	96.3 1.7	58.63 .10	80.4 1.6	44.59 .06	69.5 −0.1	57.39 .06	54.2 +0.1
18.3	66.45− .94	97.7 +1.2	58.51 −.13	81.8 +1.3	44.51 −.09	69.5 0.0	57.32 −.09	54.1 +0.1
28.3	65.48 1.01	98.7 0.7	58.37 .15	82.9 1.0	44.40 .12	69.5 +0.1	57.21 .12	54.0 0.1
Aug. 7.3	64.44 1.06	99.1 +0.2	58.21 .18	83.7 0.6	44.26 .15	69.3 0.2	57.08 .14	53.8 0.2
17.3	63.36 1.09	99.1 −0.3	58.02 .19	84.1 +0.2	44.11 .16	69 1 0.2	56.93 .16	53.6 0.2
27.2	62.27 1.09	98.5 0.8	57.83 .20	84.2 −0.1	43.94 .17	68 8 0.3	56.76 .17	53.3 0.3
Sept. 6.2	61.18−1.06	97.4 −1.3	57.63 −.19	83.9 −0.5	43.76 −.17	68.5 +0.4	56.59 −.17	53.0 +0.3
16.2	60.14 1.01	95.8 1.8	57.44 .19	83.2 0.9	43.59 .16	68.1 0.4	56.42 .16	52.7 0.3
26.1	59.16 .93	93.7 2.3	57.26 .17	82.2 1.2	43.44 .14	67 6 0.5	56.27 .14	52.3 0.3
Oct. 6.1	58.28 .83	91.2 2.7	57.10 .14	80.7 1.6	43.31 .11	67.2 0.4	56.14 .12	52.0 0.3
16.1	57.50 .70	88.3 3.1	56.98 .10	79.0 2.0	43.21 08	66.8 0.4	56.04 .08	51.7 0.2
26.1	56.88− .55	85.0 −3.4	56.90 −.06	76.8 −2.3	43.16 −.03	66.4 +0.3	55.98 −.04	51.5 +0.1
Nov. 5.0	56.41 .38	81.5 3.6	56.86 −.01	74.4 2.5	43.15 +.02	66.2 +0.2	55.97 +.02	51.5 0.0
15.0	56.12− .19	77.8 3.8	56.87 +.04	71.8 2.8	43.20 .07	66.1 0.0	56.01 .07	51.5 −0.2
25.0	56.03+ .01	74.0 3.8	56.94 .09	68.9 2 9	43.30 .13	66.2 −0.2	56.11 .12	51.8 0.4
Dec. 5.0	56.14 .21	70.2 3.8	57.06 .15	65.9 3.0	43.46 .18	66.5 0.4	56.25 .17	52.2 0.5
14.9	56.45+ .41	66.5 −3.6	57.23 +.19	62.8 −3.0	43.66 +.23	67.0 −0.6	56.45 +.22	52.9 −0.7
24.9	56.95 .59	63.0 3.3	57.45 .24	59.8 2.9	43.91 .26	67.7 0.8	56.69 .26	53.7 0.9
34.9	57.64+ .77	59.8 −3.0	57.70 +.27	56.9 −2.8	44.19 +.30	68.6 −0.9	56.96 +.29	54.7 −1.1

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	Groombridge 2320.		δ Ophiuchi.		τ Herculis.		α Scorpii. (*Antares.*)	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	h m 16 5	° ′ +68 6	h m 16 8	° ′ − 3 24	h m 16 16	° ′ +46 34	h m 16 22	° ′ −26 10
	s	″	s	″	s	″	s	″
Jan. 0.9	57.48 +.41	15.0 −3.3	26.73 +.24	11.7 −1.7	20.22 +.26	47.4 −3.3	30.34 +.27	45.8 −0.5
10.9	57.93 .48	11.9 2.9	26.99 .27	13.4 1.7	20.51 .31	44.3 3.0	30.62 .30	46.4 0.6
20.8	58.45 .55	9.2 2.4	27.27 .29	15.1 1.6	20.84 .34	41.4 2.6	30.93 .32	47.1 0.8
30.8	59.04 .61	7.0 1.9	27.57 .30	16.6 1.5	21.19 .37	39.1 2.1	31.26 .33	47.9 0.9
Feb. 9.8	59.67 .64	5.4 1.2	27.88 .30	18.0 1.3	21.57 .38	37.3 1.5	31.60 .34	48.8 0.9
19.8	60.31 +.65	4.5 −0.6	28.18 +.30	19.3 −1.1	21.96 +.38	36.1 −0.9	31.93 +.33	49.8 −0.9
29.7	60.96 .63	4.3 +0.1	28.48 .29	20.2 0.8	22.34 .38	35.5 −0.3	32.26 .32	50.7 0.9
Mar. 10.7	61.58 .60	4.8 0.8	28.76 .28	20.9 0.6	22.71 .36	35.6 +0.4	32.59 .31	51.6 0.9
20.7	62.16 .55	5.9 1.4	29.03 .26	21.3 −0.3	23.06 .34	36.3 1.0	32.89 .30	52.5 0.8
30.7	62.69 .49	7.6 1.9	29.28 .24	21.5 0.0	23.38 .31	37.5 1.5	33.18 .28	53.3 0.8
Apr. 9.6	63.14 +.41	9.8 +2.4	29.50 +.22	21.4 +0.2	23.67 +.27	39.3 +2.0	33.45 +.26	54.0 −0.7
19.6	63.51 .33	12.4 2.8	29.71 .19	21.1 0.4	23.92 .23	41.5 2.4	33.69 .23	54.7 0.7
29.6	63.79 .23	15.3 3.0	29.89 .17	20.6 0.6	24.13 .18	44.0 2.7	33.91 .20	55.3 0.6
May 9.5	63.98 .14	18.5 3.2	30.04 .14	20.0 0.7	24.28 .13	46.8 2.8	34.10 .17	55.9 0.6
19.5	64.06 +.04	21.7 3.2	30.16 .11	19.2 0.8	24.39 .09	49.7 2.9	34.26 .14	56.4 0.5
29.5	64.05 −.06	24.9 +3.1	30.26 +.08	18.4 +0.8	24.46 +.04	52.7 +2.9	34.39 +.11	56.9 −0.5
June 8.5	63.95 .16	27.9 2.9	30.32 .05	17.6 0.8	24.47 −.01	55.6 2.8	34.47 .07	57.4 0.4
18.4	63.75 .24	30.8 2.7	30.35 +.01	16.8 0.8	24.43 .06	58.3 2.6	34.53 +.03	57.8 0.4
28.4	63.47 .32	33.3 2.4	30.35 −.02	16.0 0.8	24.35 .11	60.8 2.4	34.54 .00	58.2 0.3
July 8.4	63.12 .39	35.5 2.0	30.32 .05	15.2 0.7	24.22 .15	63.1 2.1	34.52 −.04	58.5 0.3
18.4	62.69 −.46	37.3 +1.6	30.25 −.08	14.6 +0.6	24.05 −.19	65.0 +1.7	34.46 −.08	58.7 −0.2
28.3	62.21 .51	38.6 1.1	30.15 .11	14.0 0.5	23.84 .22	66.5 1.3	34.36 .11	58.9 −0.1
Aug. 7.3	61.68 .54	39.4 0.6	30.03 .13	13.5 0.4	23.60 .25	67.5 0.8	34.23 .14	59.0 0.0
17.3	61.12 .57	39.8 +0.1	29.88 .15	13.1 0.3	23.34 .27	68.2 +0.4	34.07 .17	59.0 +0.1
27.2	60.54 .58	39.6 −0.5	29.73 .16	12.9 0.2	23.06 .28	68.3 −0.1	33.90 .18	58.8 0.2
Sept. 6.2	59.95 −.58	38.9 −1.0	29.56 −.16	12.7 +0.1	22.77 −.29	68.0 −0.6	33.71 −.19	58.6 +0.3
16.2	59.38 .56	37.6 1.5	29.40 .16	12.7 −0.1	22.49 .28	67.1 1.0	33.53 .18	58.3 0.4
26.2	58.84 .52	35.9 2.0	29.24 .14	12.8 0.2	22.21 .26	65.9 1.5	33.36 .16	57.8 0.4
Oct. 6.1	58.35 .47	33.7 2.4	29.11 .12	13.1 0.4	21.97 .23	64.1 2.0	33.20 .14	57.4 0.5
16.1	57.91 .40	31.0 2.8	29.01 .08	13.6 0.5	21.75 .19	61.9 2.4	33.08 .10	56.9 0.5
26.1	57.56 −.31	28.0 −3.2	28.94 −.04	14.2 −0.7	21.58 −.14	59.3 −2.8	33.00 −.06	56.4 +0.5
Nov. 5.1	57.29 .22	24.6 3.5	28.92 .00	15.0 0.9	21.47 .08	56.4 3.1	32.96 −.01	56.0 0.4
15.0	57.12 −.11	21.0 3.7	28.94 +.05	16.1 1.1	21.42 −.02	53.2 3.3	32.98 +.05	55.6 0.3
25.0	57.07 .00	17.2 3.8	29.02 .10	17.3 1.3	21.43 +.04	49.7 3.5	33.05 .10	55.4 +0.1
Dec. 5.0	57.13 +.12	13.4 3.8	29.14 .15	18.7 1.5	21.50 .11	46.1 3.6	33.18 .16	55.4 0.0
14.9	57.31 +.23	9.5 −3.7	29.31 +.19	20.3 −1.6	21.64 +.17	42.5 −3.6	33.37 +.21	55.5 −0.2
24.9	57.59 .34	5.9 3.5	29.53 .23	22.0 1.7	21.85 .23	38.9 3.5	33.60 .25	55.8 0.4
34.9	57.98 +.44	2.5 −3.2	29.77 +.26	23.7 −1.7	22.10 +.28	35.5 −3.3	33.86 +.28	56.3 −0.6

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	η Draconis.				β Herculis.				A Draconis.				ζ Ophiuchi.			
	Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *South.*	
	h m	s	° ′	″	h m	s	° ′	″	h m	s	° ′	″	h m	s	° ′	″
	16 22		+61 45		16 25		+21 43		16 28		+69 0		16 30		−10 20	
Jan. 0.9		25.72		61.4		22.38		65.6		8.84		34.1		57.54		13.9
		+.31		−3.5		+.23		−2.8		+.35		−3.5		+.24		−1.3
10.9		26.07		58.1		22.63		62.9		9.25		30.8		57.79		15.2
		.38		3.1		.26		2.5		.45		3.1		.27		1.3
20.9		26.48		55.2		22.90		60.5		9.75		27.9		58.07		16.5
		.44		2.6		.28		2.3		.53		2.6		.29		1.3
30.8		26.95		52.8		23.19		58.4		10.32		25.5		58.36		17.8
		.48		2.1		.30		1.9		.60		2.1		.30		1.2
Feb. 9.8		27.45		51.0		23.50		56.6		10.94		23.7		58.67		19.0
		.51		1.5		.31		1.5		.64		1.5		.30		1.1
19.8		27.97		49.9		23.81		55.3		11.60		22.5		58.97		20.1
		+.52		−0.8		+.31		−1.1		+.66		−0.8		+.30		−1.0
29.8		28.49		49.4		24.11		54.5		12.27		22.0		59.27		21.0
		.52		−0.2		.30		0.6		.65		−0.1		.30		0.8
Mar. 10.7		29.00		49.5		24.41		54.1		12.92		22.2		59.57		21.7
		.50		+0.5		.29		−0.1		.64		+0.5		.29		0.6
20.7		29.49		50.4		24.69		54.3		13.55		23.1		59.85		22.3
		.46		1.1		.27		+0.4		.60		1.2		.27		0.4
30.7		29.93		51.8		24.96		54.9		14.12		24.5		60.12		22.6
		.42		1.7		.25		0.8		.54		1.7		.26		−0.2
Apr. 9.6		30.32		53.8		25.20		55.9		14.63		26.5		60.37		22.7
		+.36		+2.2		+.23		+1.2		+.47		+2.2		+.24		0.0
19.6		30.66		56.3		25.41		57.3		15.06		29.0		60.59		22.6
		.30		2.6		.20		1.5		.38		2.6		.22		+0.1
29.6		30.91		59.1		25.60		59.0		15.40		31.8		60.80		22.4
		.23		2.9		.17		1.8		.29		2.9		.19		0.3
May 9.6		31.12		62.1		25.76		60.9		15.64		34.9		60.98		22.1
		.16		3.1		.14		2.0		.19		3.1		.16		0.4
19.5		31.24		65.3		25.89		63.0		15.78		38.1		61.13		21.6
		.08		3.2		.11		2.1		+.09		3.2		.14		0.4
29.5		31.29		68.4		25.98		65.1		15.82		41.3		61.25		21.2
		+.01		+3.1		+.07		+2.1		−.01		+3.2		+.10		+0.5
June 8.5		31.26		71.6		26.04		67.2		15.76		44.4		61.34		20.7
		−.07		3.0		+.04		2.1		.11		3.1		.07		0.5
18.4		31.16		74.5		26.06		69.3		15.60		47.4		61.39		20.2
		.14		2.8		.00		2.0		.21		2.9		+.04		0.5
28.4		30.99		77.2		26.05		71.2		15.34		50.2		61.41		19.7
		.21		2.5		−.03		1.8		.30		2.6		.00		0.5
July 8.4		30.75		79.6		26.00		73.0		15.00		52.6		61.39		19.2
		.27		2.2		.07		1.6		.38		2.2		−.03		0.4
18.4		30.45		81.6		25.91		74.5		14.58		54.6		61.34		18.8
		−.32		+1.8		−.10		+1.4		−.45		+1.8		−.07		+0.4
28.3		30.11		83.2		25.80		75.8		14.10		56.3		61.26		18.4
		.37		1.3		.13		1.1		.51		1.4		.10		0.3
Aug. 7.3		29.72		84.3		25.65		76.7		13.56		57.4		61.14		18.1
		.41		0.9		.16		0.8		.56		0.9		.13		0.3
17.3		29.30		84.9		25.49		77.4		12.97		58.0		61.00		17.8
		.43		+0.4		.18		0.5		.60		+0.4		.15		0.3
27.3		28.85		85.0		25.30		77.7		12.37		58.1		60.85		17.6
		.45		−0.2		.19		+0.2		.62		−0.1		.16		0.2
Sept. 6.2		28.40		84.6		25.11		77.7		11.74		57.7		60.68		17.4
		−.45		−0.7		−.19		−0.2		−.62		−0.7		−.17		+0.1
16.2		27.95		83.7		24.92		77.3		11.13		56.8		60.51		17.3
		.44		1.2		.19		0.5		.61		1.2		.17		+0.1
26.2		27.52		82.2		24.73		76.6		10.53		55.4		60.34		17.3
		.42		1.7		.18		0.9		.58		1.7		.15		0.0
Oct. 6.1		27.12		80.3		24.57		75.6		9.97		53.5		60.20		17.3
		.38		2.2		.15		1.2		.53		2.2		.13		−0.1
16.1		26.77		77.9		24.43		74.2		9.47		51.1		60.08		17.5
		.32		2.6		.12		1.6		.46		2.6		.10		0.2
26.1		26.47		75.1		24.32		72.5		9.05		48.3		60.00		17.8
		−.26		−3.0		−.08		−1.9		−.38		−3.0		−.06		−0.4
Nov. 5.1		26.25		71.9		24.26		70.4		8.71		45.1		59.96		18.2
		.18		3.3		−.04		2.2		.29		3.3		−.02		0.5
15.0		26.11		68.5		24.25		68.1		8.47		41.6		59.96		18.8
		.10		3.6		+.01		2.4		.18		3.6		+.03		0.7
25.0		26.05		64.8		24.28		65.6		8.35		37.9		60.02		19.5
		−.01		3.7		.06		2.6		−.06		3.8		.08		0.8
Dec. 5.0		26.09		61.0		24.37		62.9		8.35		34.1		60.13		20.4
		+.08		3.8		.11		2.8		+.06		3.8		.13		1.0
14.9		26.22		57.2		24.51		60.1		8.46		30.3		60.29		21.5
		+.17		−3.8		+.16		−2.8		+.17		−3.8		+.18		−1.2
24.9		26.44		53.4		24.70		57.3		8.69		26.5		60.49		22.7
		.26		3.6		.20		2.8		.29		3.6		.22		1.3
34.9		26.74		49.9		24.92		54.5		9.04		23.0		60.72		24.0
		+.34		−3.4		+.24		−2.7		+.40		−3.4		+.25		−1.3

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Trianguli Australis.		η Herculis.		κ Ophiuchi.		d Herculis.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 16 36	° ′ −68 48	h m 16 39	° ′ +39 7	h m 16 52	° ′ + 9 32	h m 16 57	° ′ +33 43
	s	″	s	″	s	″	s	″
Jan. 0.9	44.36 +.53	56.3 +1.7	1.20 +.22	68.6 −3.3	20.06 +.21	64.0 −2.2	26.15 +.20	52.8 −3.1
10.9	44.94 .61	54.7 1.4	1.45 .26	65.5 3.0	20.28 .24	61.8 2.1	26.37 .24	49.8 2.9
20.9	45.59 .68	53.5 1.0	1.73 .30	62.6 2.7	20.53 .26	59.7 2.0	26.63 .27	47.0 2.6
30.8	46.29 .72	52.7 0.6	2.04 .32	60.2 2.2	20 80 .28	57.8 1.7	26 92 .30	44.5 2.3
Feb. 9.8	47.03 .75	52.4 +0.1	2.38 .34	58.2 1.7	21.09 .29	56.2 1.4	27.23 .31	42.5 1.8
19.8	47.80 +.76	52.5 −0.3	2.72 +.35	56.7 −1.1	21.38 +.29	54.9 −1.1	27.55 +.32	40.9 −1.3
29.8	48.56 .76	53.0 0.7	3.07 .34	55.9 −0.5	21.68 .29	54.0 0.7	27.87 .33	39.9 0.7
Mar. 10.7	49.31 .74	53.8 1.0	3.41 .33	55.7 +0.1	21.96 .28	53.5 −0.3	28.20 .32	39.5 −0.1
20.7	50.03 .70	55.0 1.4	3.74 .32	56.0 0.7	22.24 .27	53.3 +0.1	28.51 .31	39.6 +0.4
30.7	50.72 .66	56.6 1.7	4.05 .29	57.0 1.2	22.51 .26	53.6 0.4	28.82 .29	40.3 1.0
Apr. 9.6	51.35 +.61	58.4 −2.0	4.33 +.27	58.4 +1.7	22.76 +.24	54.2 +0.8	29.10 +.27	41.6 +1.4
19.6	51.93 .55	60.5 2.2	4.58 .23	60.3 2.1	23.00 .22	55.1 1.0	29.35 .24	43.2 1.9
29.6	52.44 .48	62.8 2.4	4.80 .20	62.6 2.4	23.21 .20	56.3 1.3	29.57 .21	45.3 2.2
May 9.6	52.88 .40	65.3 2.5	4.98 .16	65.1 2.6	23.39 .17	57.7 1.5	29.77 .18	47.6 2.4
19.5	53.24 .31	67.9 2.6	5.12 .12	67.8 2.8	23.55 .14	59.2 1.6	29.93 .14	50.2 2.6
29.5	53.51 +.22	70.6 −2.7	5.21 +.07	70.6 +2.8	23.67 +.11	60.8 +1.6	30.05 +.10	52.8 +2.7
June 8.5	53.68 .12	73.2 2.6	5.26 +.03	73.4 2.7	23.76 .08	62.5 1.6	30.13 .06	55.5 2.6
18.5	53.75 +.02	75.9 2.5	5.27 −.01	76.1 2.6	23.82 +.04	64.1 1.6	30.16 +.02	58.1 2.5
28.4	53.72 −.08	78.3 2.4	5.24 .06	78.6 2.4	23.85 .00	65.6 1.5	30.16 −.03	60.6 2.4
July 8.4	53.59 .18	80.7 2.2	5.16 .10	80.9 2.1	23.83 −.03	67.0 1.3	30.11 .07	62.9 2.2
18.4	53.36 −.27	82.7 −1.9	5.04 −.14	82.9 +1.8	23.78 −.07	68.3 +1.2	30.02 −.11	64.9 +1.9
28.3	53.05 .35	84.4 1.6	4.88 .17	84.6 1.5	23.70 .10	69.3 1.0	29.89 .14	66.6 1.6
Aug. 7.3	52.67 .42	85.8 1.2	4.69 .20	85.8 1.1	23.59 .13	70.2 0.8	29.73 .18	68.0 1.2
17.3	52.22 .47	86.8 0.7	4.47 .23	86.7 0.6	23.44 .15	70.9 0.5	29.54 .20	69.0 0.8
27.3	51.72 .51	87.3 −0.3	4.24 .24	87.1 +0.2	23.28 .17	71.3 0.3	29.33 .22	69.6 +0.4
Sept. 6.2	51.20 −.52	87.3 +0.2	3.98 −.25	87.1 −0.2	23.10 −.18	71.5 +0.1	29.10 −.23	69.8 0.0
16.2	50.68 .51	86.8 0.7	3.72 .25	86.7 0.7	22.93 .18	71.4 −0.2	28.86 .23	69.6 −0.4
26.2	50.18 .48	85.9 1.1	3.48 .23	85.7 1.2	22.75 .17	71.1 0.5	28.63 .22	69.0 0.9
Oct. 6.2	49.72 .42	84.6 1.5	3.25 .21	84.4 1.6	22.59 .15	70.5 0.7	28.42 .20	67.9 1.3
16.1	49.34 .34	82.8 1.9	3.06 .18	82.6 2.0	22.44 .13	69.7 1.0	28.22 .18	66.4 1.7
26.1	49.05 −.24	80.7 +2.2	2.90 −.14	80.4 −2.4	22.34 −.09	68.5 −1.2	28.07 −.14	64.5 −2.1
Nov. 5.1	48.87 −.12	78.4 2.4	2.78 .09	77.8 2.7	22.26 −.05	67.2 1.5	27.95 .09	62.2 2.4
15.0	48.80 .00	76.0 2.5	2.72 −.03	74.9 3.0	22.24 .00	65.6 1.7	27.88 −.04	59.6 2.7
25.0	48.87 +.13	73.5 2.5	2.71 +.02	71.7 3.2	22.26 +.05	63.7 1.9	27.86 +.01	56.7 3.0
Dec. 5.0	49.06 .25	71.0 2.4	2.77 .08	68.4 3.3	22.33 .09	61.7 2.1	27.90 .07	53.6 3.1
15.0	49.37 +.37	68.7 +2.2	2.88 +.14	65.0 −3.3	22.45 +.14	59.5 −2.2	28.00 +.12	50.4 −3.2
24.9	49.80 .48	66.7 1.9	3.05 .19	61.5 3.4	22.61 .18	57.3 2.2	28.15 .17	47.2 3.2
34.9	50.33 +.58	64.9 +1.5	3.27 +.24	58.2 −3.2	22.82 +.22	55.1 −2.2	28.34 +.22	44.0 −3.1

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ε Ursæ Minoris.		α¹ Herculis.		b Ophiuchi.		β Draconis.	
	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination South.	Right Ascension.	Declination North.
	h m 16 57	° ′ +82 12	h m 17 9	° ′ +14 30	h m 17 19	° ′ −24 4	h m 17 27	° ′ +52 22
	s	″	s	″	s	″	s	″
Jan. 0.9	19.93+ .55	71.8 −3.5	30.43 +.19	70.9 −2.4	29.54 +.21	8.2 −0.3	51.62 +.18	65.4 −3.6
10.9	20.64 .84	68.4 3.1	30.63 .22	68.6 2.3	29.77 .25	8.5 0.4	51.82 .23	61.9 3.4
20.9	21.61 1.10	65.5 2.7	30.87 .25	66.3 2.1	30.04 .28	8.9 0.5	52.09 .29	58.6 3.1
30.9	22.83 1.31	62.9 2.3	31.13 .27	64.3 1.9	30.33 .30	9.4 0.5	52.40 .33	55.7 2.7
Feb. 9.8	24.24 1.48	60.9 1.7	31.41 .29	62.6 1.6	30.63 .31	9.9 0.5	52.75 .37	53.2 2.2
19.8	25.79+1.59	59.5 −1.1	31.70 +.29	61.2 −1.2	30.95 +.32	10.5 −0.5	53.14 +.39	51.4 −1.6
29.8	27.42 1.64	58.7 −0.4	32.00 .29	60.2 0.8	31.28 .32	11.0 0.5	53.54 .41	50.1 0.9
Mar. 10.8	29.07 1.63	58.6 +0.2	32.29 .29	59.6 −0.3	31.60 .32	11.4 0.4	53.95 .41	49.5 −0.3
20.7	30.67 1.56	59.2 0.8	32.58 .28	59.5 +0.1	31.92 .31	11.9 0.4	54.36 .40	49.5 +0.3
30.7	32.18 1.43	60.3 1.4	32.85 .27	59.8 0.5	32.23 .30	12.2 0.3	54.75 .38	50.1 1.0
Apr. 9.7	33.54+1.26	62.0 +2.0	33.12 +.25	60.5 +0.9	32.52 +.29	12.5 −0.3	55.13 +.36	51.4 +1.5
19.6	34.70 1.05	64.2 2.4	33.36 .23	61.6 1.2	32.80 .27	12.7 0.2	55.47 .32	53.2 2.0
29.6	35.63 .81	66.8 2.7	33.58 .21	63.0 1.5	33.06 .25	12.9 0.2	55.78 .28	55.5 2.5
May 9.6	36.31 .54	69.7 3.0	33.78 .18	64.6 1.7	33.30 .23	13.1 0.2	56.04 .24	58.2 2.8
19.6	36.71+ .26	72.8 3.1	33.95 .16	66.4 1.8	33.52 .20	13.2 0.2	56.25 .18	61.1 3.0
29.5	36.84− .02	75.9 +3.1	34.09 +.12	68.3 +1.9	33.70 +.16	13.4 −0.2	56.41 +.13	64.2 +3.1
June 8.5	36.67 .30	79.1 3.1	34.20 .09	70.2 1.9	33.84 .13	13.6 0.2	56.51 .07	67.4 3.2
18.5	36.24 .57	82.1 2.9	34.27 .05	72.1 1.9	33.95 .09	13.8 0.2	56.55 +.01	70.6 3.1
28.4	35.54 .82	84.9 2.7	34.30 +.02	73.9 1.8	34.02 .05	14.0 0.2	56.53 −.05	73.6 3.0
July 8.4	34.60 1.05	87.5 2.4	34.30 −.02	75.7 1.7	34.05 +.01	14.2 0.2	56.45 .11	76.5 2.7
18.4	33.45−1.25	89.7 +2.0	34.25 −.06	77.2 +1.4	34.03 −.04	14.4 −0.2	56.31 −.16	79.1 +2.4
28.4	32.09 1.43	91.6 1.6	34.17 .10	78.5 1.2	33.98 .08	14.7 0.2	56.12 .21	81.4 2.1
Aug. 7.3	30.59 1.57	93.0 1.2	34.06 .13	79.5 1.0	33.88 .11	14.9 0.2	55.88 .26	83.2 1.7
17.3	28.96 1.68	93.9 0.7	33.92 .15	80.4 0.7	33.75 .14	15.0 0.1	55.60 .30	84.7 1.2
27.3	27.23 1.75	94.3 +0.2	33.75 .17	80.9 0.4	33.59 .17	15.1 −0.1	55.29 .33	85.7 0.8
Sept. 6.3	25.46−1.78	94.3 −0.3	33.57 −.18	81.2 +0.1	33.42 −.18	15.2 0.0	54.95 −.34	86.3 +0.3
16.2	23.67 1.77	93.7 0.8	33.38 .19	81.2 −0.2	33.23 .19	15.1 +0.1	54.60 .35	86.3 −0.2
26.2	21.92 1.72	92.6 1.3	33.20 .18	80.9 0.5	33 04 .18	15.0 0.1	54.24 .35	85.8 0.7
Oct. 6.2	20.24 1.62	91.1 1.8	33.02 .17	80.3 0.8	32.83 .17	14.9 0.2	53.90 .33	84.8 1.2
16.1	18.67 1.49	89.1 2.2	32.87 .14	79.3 1.1	32.71 .14	14.6 0.2	53.58 .30	83.4 1.7
26.1	17.26−1.31	86.6 −2.6	32.74 −.11	78.1 −1.4	32.59 −.10	14.4 +0.2	53.30 −.26	81.4 −2.2
Nov. 5.1	16.05 1.10	83.8 3.0	32.65 .07	76.6 1.6	32.50 .06	14.2 0.2	53.06 .21	79.0 2.6
15.1	15.07 .84	80.6 3.3	32.61 −.02	74.8 1.9	32.47 −.01	14.0 0.2	52.88 .15	76.2 3.0
25.0	14.36 .56	77.2 3.5	32.61 +.03	72.8 2.1	32.48 +.04	13.9 +0.1	52.76 .08	73.0 3.3
Dec. 5.0	13.94− .26	73.6 3.6	32.66 .07	70.6 2.3	32.55 .09	13.8 0.0	52.72 −.01	69.6 3.5
15.0	13.83+ .05	69.9 −3.7	32.76 +.12	68.2 −2.4	32.67 +.14	13.9 −0.1	52.74 +.06	65.9 −3.6
25.0	14.04 .36	66.3 3.6	32.90 .16	65.8 2.4	32.84 .19	14.1 0.2	52.83 .13	62.3 3.6
34.9	14.55+ .66	62.8 −3.4	33.09 +.21	63.3 −2.4	33.05 +.23	14.4 −0.3	53.00 +.22	58.7 −3.5

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ophiuchi.		ω Draconis.		μ Herculis.		ψ¹ Draconis.	
	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.
	h m 17 29	+ 12° 38′	h m 17 37	+ 68° 48′	h m 17 42	+ 27° 47′	h m 17 43	+ 72° 11′
	s	″	s	″	s	″	s	″
Jan. 1.0	42.09 +.17	36.1 −2.3	32.86 +.17	36.0 −3.7	2.44 +.15	14.9 −2.9	51.69 +.16	74.4 −3.7
10.9	42.28 .20	33.8 2.2	33.09 .28	32.4 3.5	2.61 .19	12.0 2.8	51.92 .30	70.7 3.5
20.9	42.50 .23	31.6 2.1	33.43 .39	29.0 3.2	2.82 .23	9.2 2.6	52.28 .42	67.3 3.2
30.9	42.75 .26	29.6 1.8	33.86 .47	26.0 2.8	3.07 .26	6.7 2.3	52.76 .53	64.3 2.8
Feb. 9.8	43.02 .27	27.9 1.6	34.38 .55	23.5 2.3	3.34 .28	4.6 1.9	53.34 .62	61.7 2.3
19.8	43.30 +.28	26.5 −1.2	34.95 +.60	21.5 −1.7	3.62 +.29	2.8 −1.5	53.99 +.68	59.6 −1.8
29.8	43.59 .29	25.5 0.8	35.57 .63	20.1 1.0	3 93 .30	1.6 1.0	54.71 .73	58.2 1.1
Mar. 10.8	43.88 .29	24.9 −0.4	36.22 .65	19.4 −0.4	4.23 .31	0.8 −0.5	55.45 .75	57.4 −0.5
20.7	44.17 .28	24.7 0.0	36.87 .64	19.4 +0.3	4.54 .30	0.6 +0.1	56.21 .74	57.3 +0.2
30.7	44.45 .28	25.0 +0.4	37.50 .61	20.0 0.9	4.84 .29	1.0 0.6	56.94 .72	57.8 0.9
Apr. 9.7	44.72 +.26	25.6 +0.8	38.09 +.57	21.3 +1.6	5.13 +.28	1.8 +1.1	57.64 +.67	59.0 +1.5
19.7	44.97 .24	26.6 1.1	38.63 .51	23.1 2.1	5.40 .26	3.1 1.5	58.28 .60	60.7 2.0
29.6	45.21 .22	27.9 1.4	39.10 .43	25.5 2.5	5.65 .24	4.8 1.9	59.84 .51	63.0 2.5
May 9.6	45.42 .20	29.4 1.6	39.50 .35	28.2 2.9	5.88 .21	6.9 2.2	59.30 .41	65.7 2.8
19.6	45.61 .17	31.2 1.8	39.80 .26	31.2 3.1	6.08 .18	9.2 2.4	59.66 .30	68.6 3.1
29.6	45.77 +.14	33.0 +1.9	40.01 +.16	34.4 +3.3	6.25 +.15	11.6 +2.5	59.90 +.18	71.8 +3.2
June 8.5	45.90 .11	34.9 1.9	40.12 +.05	37.7 3.3	6.38 .11	14.2 2.5	60.02 +.06	75.1 3.3
18.5	45.99 .07	36.7 1.8	40.12 −.05	41.0 3.3	6.46 .07	16.7 2.5	60.03 −.06	78.3 3.2
28.5	46.04 +.03	38.5 1.7	40.02 .15	44.2 3.1	6.51 +.03	19.2 2.4	59.90 .18	81.6 3.1
July 8.4	46.06 .00	40 2 1.6	39.82 .25	47.3 2.9	6.51 −.02	21.5 2.2	59.66 .30	84.6 2.9
18.4	46.03 −.04	41.7 +1.4	39.53 −.34	50.0 +2.6	6.48 −.06	23.6 +2.0	59.31 −.40	87.4 +2.6
28.4	45.97 .08	43.1 1.2	39 15 .42	52.4 2.2	6.40 .10	25.5 1.7	58.86 .50	89.8 2.3
Aug. 7.4	45.87 .11	44.2 1.0	38.69 .49	54.5 1.8	6.28 .14	27.1 1.4	58.31 .59	91.9 1.9
17.3	45.74 .14	45.0 0.7	38.16 .55	56.1 1.4	6.12 .17	28.4 1.1	57.68 .66	93.6 1.4
27.3	45.58 .17	45.7 0.5	37.59 .60	57.3 0.9	5.94 .19	29.3 0.7	56.99 .71	94.8 1.0
Sept. 6.3	45.41 −.18	46.0 +0.2	36.97 −.63	57.9 +0.4	5.74 −.21	29.9 +0.4	56.25 −.75	95.6 +0.5
16.2	45.22 .19	46.1 −0.1	36.33 .64	58.1 −0.1	5.52 .22	30.1 0.0	55.48 .77	95.8 0.0
26.2	45.04 .18	45.9 0.3	35.69 .64	57.7 0.6	5.30 .22	29.8 −0.4	54.71 .77	95.5 −0.6
Oct. 6.2	44.85 .17	45.4 0.6	35.05 .62	56.8 1.2	5.08 .21	29.2 0.8	53.95 .75	94.6 1.1
16.2	44.69 .15	44.6 0.9	34.45 .57	55.4 1.7	4.88 .19	28.2 1.2	53.22 .70	93.3 1.6
26.1	44.56 −.12	43.5 −1.2	33.90 −.52	53.4 −2.2	4.71 −.16	26.8 −1.6	52.54 −.64	91.4 −2.1
Nov. 5.1	44.45 .08	42.2 1.5	33.42 .44	51.0 2.6	4.57 .12	25.0 2.0	51.94 .55	89.1 2.6
15.1	44.40 − 04	40.6 1.7	33.02 .35	48.2 3.0	4.47 .07	22.8 2.3	51.44 .45	86.3 3.0
25.1	44.38 +.01	38.7 2.0	32.72 .25	45.0 3.3	4 42 −.03	20.4 2.6	51.04 .33	83.2 3.3
Dec. 5.0	44.41 .06	36.7 2.1	32.53 .14	41.5 3.6	4.42 +.02	17.7 2.8	50.77 .20	79.8 3.5
15.0	44.49 +.10	34.4 −2 3	32.45 −.02	37.9 −3.7	4.47 +.07	14.8 −2.9	50.64 −.06	76.1 −3.7
25.0	44.62 .15	32.1 2.3	32.49 +.10	34.1 3.7	4.57 .12	11.8 3.0	50.64 +.07	72.4 3.7
35.0	44.79 +.19	29.8 −2.3	32.65 +.21	30.4 −3.6	4.72 +.17	8.8 −2.9	50.78 +.21	68.7 −3.6

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	γ Draconis.		γ² Sagittarii.		μ Sagittarii.		η Serpentis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*
	h m 17 53	° ′ +51 29	h m 17 58	° ′ −30 25	h m 18 7	° ′ −21 5	h m 18 15	° ′ − 2 55
	s	″	s	″	s	″	s	″
Jan. 1.0	57.82 +.13	70.7 −3.6	34.27 +.18	21.3 +0.3	1.57 +.18	8.1 −0.2	28.73 +.14	32.2 −1.4
11.0	57.99 .19	67.2 3.4	34.47 .23	21.2 0.2	1.76 .21	8.4 0.3	28.88 .17	33.5 1.3
20.9	58.21 .25	63.8 3.2	34.72 .26	20.9 0.1	1.98 .23	8.7 0.3	29.07 .20	34.9 1.3
30.9	58.48 .30	60.8 2.8	34.99 .29	20.8 +0.1	2.23 .26	9.0 0.3	29.29 .23	36.1 1.2
Feb. 9.9	58.80 .34	58.2 2.4	35.29 .31	20.8 0.0	2.50 .28	9.4 0.3	29.53 .25	37.2 1.0
19.8	59.16 +.37	56.0 −1.8	35.61 +.32	20.8 0.0	2.79 +.30	9.6 −0.2	29.79 +.27	38.2 −0.8
29.8	59.54 .39	54.5 1.2	35.94 .33	20.9 −0.1	3.09 .31	9.9 0.2	30.06 .28	38.9 0.6
Mar. 10.8	59.94 .40	53.6 −0.6	36.27 .34	20.9 0.1	3.40 .31	10.0 −0.1	30.35 .28	39.3 −0.3
20.8	60.34 .40	53.3 +0.1	36.61 .34	21.0 0.1	3.71 .31	10.1 0.0	30.63 .29	39.4 0.0
30.7	60.74 .39	53.7 0.7	36.95 .33	21.1 0.1	4.02 .31	10.0 +0.1	30.92 .29	39.3 +0.3
Apr. 9.7	61.12 +.37	54.8 +1.3	37.28 +.32	21.2 −0.1	4.33 +.30	9.9 +0.2	31.20 +.28	38.9 +0.5
19.7	61.48 .34	56.3 1.8	37.60 .31	21.3 0.1	4.63 .29	9.7 0.2	31.48 .27	38.3 0.7
29.6	61.81 .31	58.4 2.3	37.90 .29	21.5 0.2	4.91 .28	9.5 0.2	31.74 .26	37.5 0.9
May 9.6	62.09 .26	60.9 2.7	38.18 .27	21.7 0.2	5.18 .26	9.2 0.3	31.99 .24	36.5 1.0
19.6	62.34 .22	63.8 2.9	38.44 .24	22.0 0.3	5.43 .23	9.0 0.2	32.22 .22	35.4 1.1
29.6	62.53 +.17	66.8 +3.1	38.67 +.21	22.3 −0.4	5.65 +.21	8.7 +0.2	32.43 +.19	34.2 +1.2
June 8.5	62.67 .11	70.0 3.2	38.87 .18	22.7 0.4	5.84 .17	8.5 0.2	32.60 .16	33.0 1.2
18.5	62.74 +.05	73.2 3.2	39.02 .14	23.1 0.5	5.99 .13	8.4 +0.1	32.75 .13	31.8 1.1
28.5	62.76 −.01	76.4 3.1	39.14 .09	23.6 0.5	6.11 .09	8.4 0.0	32.85 .09	30.7 1.1
July 8.4	62.72 .07	79.4 2.9	39.20 +.04	24.2 0.6	6.18 +.05	8.4 0.0	32.92 .05	29.7 1.0
18.4	62.62 −.13	82.2 +2.6	39.23 .00	24.8 −0.6	6.20 .00	8.4 −0.1	32.95 +.01	28.7 +0.9
28.4	62.47 .18	84.7 2.3	39.20 −.05	25.4 0.6	6.19 −.04	8.5 0.1	32.93 −.04	27.9 0.7
Aug. 7.4	62.26 .23	86.8 2.0	39.13 .09	25.9 0.5	6.13 .08	8.7 0.2	32.87 .08	27.3 0.6
17.3	62.00 .27	88.6 1.6	39.01 .13	26.4 0.5	6.03 .12	8.9 0.2	32.78 .11	26.8 0.4
27.3	61.71 .31	89.9 1.1	38.86 .16	26.9 0.4	5.90 .15	9.1 0.2	32.65 .14	26.4 0.3
Sept. 6.3	61.39 −.33	90.8 +0.6	38.69 −.19	27.2 −0.3	5.74 −.17	9.2 −0.2	32.50 −.16	26.2 +0.1
16.3	61.04 .35	91.2 +0.1	38.49 .20	27.4 −0.1	5.56 .18	9.4 0.1	32.33 .17	26.1 0.0
26.2	60.69 .34	91.1 −0.4	38.29 .20	27.5 0.0	5.37 .19	9.5 −0.1	32.15 .18	26.2 −0.2
Oct. 6.2	60.35 .33	90.4 0.9	38.09 .19	27.5 +0.1	5.19 .18	9.6 0.0	31.98 .17	26.4 0.3
16.2	60.02 .31	89.3 1.4	37.91 .17	27.3 0.2	5.02 .16	9.6 0.0	31.81 .16	26.8 0.4
26.2	59.73 −.28	87.6 −1.9	37.75 −.14	27.0 +0.3	4.87 −.13	9.6 0.0	31.66 −.13	27.3 −0.6
Nov. 5.1	59.47 .23	85.5 2.3	37.63 .10	26.6 0.4	4.75 .09	9.6 0.0	31.54 .10	28.0 0.7
15.1	59.26 .18	83.0 2.7	37.56 −.05	26.2 0.4	4 68 −.05	9.6 0.0	31.46 .06	28.8 0.9
25.1	59.12 .11	80.1 3.1	37.53 .00	25.7 0.5	4.65 .00	9.6 0.0	31.42 −.02	29.8 1.0
Dec. 5.0	59.03 −.05	76.8 3.4	37.56 + 06	25.3 0.4	4.67 +.04	9.7 −0.1	31.42 +.03	30.9 1.2
15.0	59.02 +.02	73.3 −3.5	37.65 +.11	24.9 +0.4	4.74 +.09	9.8 −0.2	31.47 +.07	32.1 −1.3
25.0	59.07 .09	69.7 3.6	37.78 .16	24.5 0.3	4.86 .14	10.1 0.2	31.57 .11	33.4 1.3
35.0	59.19 +.15	66.1 −3.5	37.97 + 21	24.2 +0.3	5.02 +.18	10.3 −0.3	31.70 +.15	34.8 −1.4

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	1 Aquilæ.				σ Octantis.				α Lyræ. (*Vega.*)				β Lyræ.			
	Right Ascension.		Declination *South.*		Right Ascension.		Declination *South.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*	
	h m 18 29		° ′ − 8 19		h 18		° ′ −89 15		h m 18 33		° ′ +38 40		h m 18 45		° ′ +33 13	
	s		″		m s	s	″		s		″		s		″	
Jan. 1.0	4.54	+.13	13.7	−1.0	36 32.0	+ 4.5	62.5	+3.3	6.61	+.08	51.3	−3.2	54.58	+.08	63.1	−3.0
11.0	4.69	.16	14.7	1.0	36 38.1	7.6	59.2	3.2	6.72	.13	48.1	3.2	54.68	.12	60.1	3.0
20.9	4.87	.20	15.7	1.0	36 47.2	10.5	56.2	2.9	6.88	.18	45.0	3.0	54.83	.16	57.2	2.9
30.9	5.08	.23	16.6	0.9	36 59.1	13.0	53.3	2.7	7.08	.22	42.0	2.8	55.01	.20	54.4	2.6
Feb. 9.9	5.32	.25	17.4	0.7	37 13.3	15.2	50.8	2.3	7.32	.26	39.4	2.4	55.23	.24	51.9	2.3
19.9	5.58	+.26	18.1	−0.6	37 29.6	+17.0	48.7	+1.9	7.59	+.29	37.3	−1.9	55.48	+.26	49.8	−1.9
29.8	5.85	.28	18.6	0.4	37 47.4	18.4	47.0	1.5	7.89	.31	35.6	1.4	55.76	.29	48.1	1.4
Mar. 10.8	6.13	.29	18.8	−0.2	38 6.3	19.3	45.8	1.0	8.21	.32	34.4	0.8	56.06	.30	47.0	0.9
20.8	6.42	.29	18.9	+0.1	38 26.0	19.8	45.0	+0.5	8.54	.33	33.9	−0.3	56.37	.31	46.4	−0.3
30.8	6.72	.29	18.7	0.3	38 45 9	19.9	44.7	0.0	8.87	.33	33.9	+0.4	56.68	.32	46.3	+0.2
Apr. 9.7	7.01	+.29	18.3	+0.5	39 5.7	+19.5	44.9	−0.4	9.21	+.33	34.6	+0.9	57.00	+.31	46.9	+0.8
19.7	7.29	.28	17.8	0.7	39 25.0	18.8	45.6	0.9	9.53	.32	35.7	1.4	57.31	.30	47.9	1.3
29.7	7.57	.27	17.1	0.8	39 43.3	17.6	46.8	1.4	9.84	.30	37.4	1.9	57.61	.29	49.5	1.8
May 9.6	7.83	.25	16.2	0.9	40 0.3	16.2	48.4	1.8	10.12	.27	39.5	2.3	57.89	.27	51.5	2.1
19.6	8.08	.23	15.3	1.0	40 15.6	14.3	50.4	2.2	10.38	.24	42.0	2.6	58.15	.24	53.8	2.4
29.6	8.30	+.21	14.3	+1.0	40 28.9	+12.2	52.7	−2.5	10.60	+.20	44.7	+2.8	58.38	+.21	56.3	+2.7
June 8.6	8.49	.18	13.3	0.9	40 39.9	9.7	55.4	2.8	10.78	.16	47.6	3.0	58.57	.17	59.1	2.8
18.5	8.65	.14	12.4	0.9	40 48.4	7.1	58.3	3.0	10.92	.11	50.7	3.0	58.72	.13	61.9	2.8
28.5	8.78	.10	11.5	0.8	40 54.1	4.2	61.3	3.1	11.01	.07	53.6	3.0	58.83	.09	64.8	2.8
July 8.5	8.86	.06	10.7	0.7	40 56.8	+ 1.2	64.4	3.1	11.05	+.02	56.6	2.8	58.89	+.04	67.6	2.7
18.5	8.90	+.02	10.1	+0.6	40 56.5	− 1.8	67.6	−3.1	11.04	−.03	59.3	+2.7	58.91	−.01	70.2	+2.6
28.4	8.90	−.02	9.5	0.5	40 53.2	4.8	70.6	2.9	10.98	.08	61.9	2.4	58.87	.06	72.7	2.4
Aug. 7.4	8.86	.06	9.1	0.4	40 47.0	7.6	73.4	2.7	10.87	.13	64.2	2.1	58.79	.11	74.9	2.1
17.4	8.78	.10	8.7	0.3	40 38.0	10.2	76.0	2.4	10.71	.17	66.2	1.8	58.67	.15	76.8	1.7
27.3	8.66	.13	8.5	+0.1	40 26.6	12.4	78.2	2.0	10.52	.21	67.8	1.4	58.50	.18	78.4	1.4
Sept. 6.3	8.52	−.15	8.4	0.0	40 13.2	−14.2	79.9	−1.5	10.30	−.23	69.0	+1.0	58.31	−.21	79.6	+1.0
16.3	8.35	.17	8.5	−0.1	39 58.1	15.5	81.1	0.9	10.05	.25	69.7	0.5	58.09	.23	80.4	0.6
26.3	8.18	.18	8.5	0.1	39 42.1	16.2	81.8	−0.4	9.80	.26	70.1	+0.1	57.86	.24	80.9	+0.2
Oct. 6.2	8.00	.17	8.7	0.2	39 25.7	16.3	81.8	+0.2	9.53	.26	69.9	−0.4	57.62	.24	80.8	−0.2
16.2	7.83	.16	9.0	0.3	39 9.6	15.7	81.3	0.8	9.28	.25	69.3	0.8	57.38	.23	80.4	0.7
26.2	7.68	−.14	9.4	−0.4	38 54.4	−14.4	80.1	+1.4	9.04	−.22	68.2	−1.3	57.16	−.21	79.4	−1.1
Nov. 5.2	7.56	.11	9.9	0.5	38 40.7	12.6	78.4	2.0	8.83	.19	66.7	1.7	56.97	.18	78.1	1.5
15.1	7.47	.07	10.4	0.6	38 29.1	10.2	76.2	2.4	8.66	.15	64.8	2.1	56.81	.14	76.3	1.9
25.1	7.42	−.03	11.1	0.7	38 20.2	7.4	73.6	2.8	8.53	.10	62.4	2.5	56.69	.10	74.2	2.3
Dec. 5.1	7.42	+.02	11.9	0.8	38 14.3	4.3	70.7	3.1	8.46	−.05	59.7	2.8	56.61	−.05	71.8	2.6
15.0	7.46	+.06	12.8	−0.9	38 11.7	− 1.0	67.5	+3.2	8.43	.00	56.8	−3.0	56.58	.00	69.0	−2.8
25.0	7.54	.11	13.7	1.0	38 12.4	+ 2.4	64.2	3.3	8.45	+.05	53.6	3.2	56.61	+.05	66.1	2.9
35.0	7.67	+.15	14.7	−1.0	38 16.4	+ 5.7	60.9	+3.2	8.54	+.11	50.4	−3.2	56.68	+.09	63.1	−3.0

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	σ Sagittarii.		50 Draconis.		ζ Aquilæ.		d Sagittarii.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	h m 18 48	° ′ −26 25	h m 18 49	° ′ +75 17	h m 19 0	° ′ +13 41	h m 19 11	° ′ −19 8
	s	″	s	″	s	″	s	″
Jan. 1.0	16.73 +.13	62.2 +0.2	54.36 −.08	71.1 −3.5	13.69 +.08	55.1 −2.1	2.55 +.10	62.8 −0.2
11.0	16.88 .17	62.0 0.2	54.36 +.08	67.5 3.6	13.79 .12	53.0 2.1	2.66 .13	62.9 0.2
20.9	17.07 .20	61.8 0.2	54.52 .25	64.0 3.5	13.93 .15	50.9 2.0	2.82 .17	63.1 0.1
30.9	17.29 .23	61.6 0.2	54.85 .40	60.6 3.3	14.10 .18	48.9 1.8	3.00 .20	63.2 −0.1
Feb. 9.9	17.54 .26	61.4 0.2	55.32 .54	57.5 2.9	14.30 .21	47.2 1.5	3.22 .23	63.3 0.0
19.9	17.81 +.28	61.2 +0.2	55.93 +.66	54.8 −2.4	14.53 +.24	45.7 −1.3	3.46 +.25	63.2 +0.1
29.9	18.10 .30	61.0 0.3	56.64 .76	52.6 1.9	14.77 .26	44.5 1.0	3.72 .27	63.1 0.2
Mar. 10.8	18.41 .31	60.7 0.3	57.45 .83	51.0 1.3	15.04 .27	43.7 0.6	4.00 .29	62.9 0.3
20.8	18.73 .32	60.4 0.3	58.30 .87	50.0 −0.6	15.31 .28	43.4 −0.1	4.30 .30	62.5 0.4
30.8	19.05 .32	60.0 0.4	59.18 .88	49.7 0.0	15.60 .29	43.5 +0.3	4.60 .31	62.1 0.5
Apr. 9.7	19.38 +.32	59.6 +0.4	60.06 +.86	50.0 +0.7	15.89 +.29	43.9 +0.7	4.91 +.31	61.5 +0.6
19.7	19.70 .32	59.3 0.4	60.91 .82	51.0 1.3	16.17 .28	44.8 1.1	5.22 .31	60.9 0.7
29.7	20.02 .31	58.9 0.4	61.70 .75	52.6 1.8	16.46 .28	46.1 1.4	5.52 .30	60.2 0.7
May 9.7	20.32 .30	58.5 0.3	62.41 .65	54.7 2.3	16.73 .26	47.6 1.7	5.82 .29	59.5 0.7
19.6	20.61 .27	58.3 0.2	63.01 .54	57.2 2.7	16.98 .24	49.4 1.9	6.11 .27	58.7 0.7
29.6	20.87 +.25	58.1 +0.1	63.49 +.42	60.0 +3.0	17.21 +.22	51.4 +2.0	6.37 +.25	58.1 +0.6
June 8.6	21.11 .22	58.0 0.0	63.84 .28	63.2 3.2	17.42 .19	53.5 2.1	6.61 .23	57.5 0.5
18.6	21.31 .18	58.0 −0.1	64.05 +.14	66.5 3.3	17.59 .15	55.6 2.1	6.82 .19	57.0 0.5
28.5	21.47 .14	58.1 0.2	64.11 −.01	69.9 3.4	17.73 .12	57.7 2.1	7.00 .15	56.6 0.3
July 8.5	21.58 .09	58.3 0.3	64.03 .16	73.2 3.3	17.82 .07	59.7 2.0	7.13 .11	56.3 0.2
18.5	21.65 +.05	58.6 −0.4	63.79 −.30	76.5 +3.2	17.87 +.03	61.6 +1.8	7.22 +.06	56.1 +0.1
28.4	21.67 .00	59.1 0.4	63.42 .44	79.5 2.9	17.88 −.01	63.4 1.7	7.26 +.02	56.1 0.0
Aug. 7.4	21.65 −.05	59.5 0.5	62.91 .56	82.3 2.7	17.84 .06	65.0 1.4	7.25 −.03	56.2 −0.1
17.4	21.58 .09	60.0 0.5	62.29 .68	84.8 2.3	17.77 .09	66.3 1.0	7.20 .07	56.3 0.2
27.4	21.46 .13	60.5 0.5	61.56 .78	87.0 1.9	17.66 .13	67.4 0.9	7.11 .11	56.6 0.3
Sept. 6.3	21.32 −.16	61.0 −0.4	60.74 −.85	88.7 +1.5	17.51 −.15	68.2 +0.7	6.99 −.14	56.9 −0.3
16.3	21.15 .18	61.4 0.4	59.86 .91	90.0 1.0	17.35 .17	68.7 0.4	6.83 .16	57.2 0.3
26.3	20.96 .19	61.7 0.3	58.93 .94	90.7 +0.5	17.16 .18	69.0 +0.1	6.66 .18	57.5 0.3
Oct. 6.2	20.76 .19	61.9 0.2	57.98 .95	91.0 0.0	16.98 .19	68.9 −0.2	6.48 .18	57.8 0.3
16.2	20.58 .18	62.1 −0.1	57.03 .92	90.7 −0.6	16.79 .18	68.6 0.5	6.30 .17	58.1 0.3
26.2	20.41 −.16	62.1 0.0	56.11 −.89	89.8 −1.1	16.62 −.16	67.9 −0.8	6.14 −.16	58.3 −0.2
Nov. 5.2	20.26 .13	62.1 +0.1	55.24 .83	88.5 1.6	16.46 .14	67.0 1.1	5.99 .13	58.6 0.2
15.1	20.16 .09	61.9 0.2	54.45 .74	86.6 2.1	16.34 .11	65.8 1.3	5.87 .10	58.8 0.2
25.1	20.09 −.04	61.8 0.2	53.76 .63	84.2 2.6	16.25 .07	64.3 1.6	5.80 .06	58.9 0.2
Dec. 5.1	20.07 +.01	61.6 0.2	53.20 .50	81.4 3.0	16.20 −.03	62.6 1.8	5.76 −.01	59.1 0.2
15.1	20.10 +.05	61.3 +0.2	52.77 −.35	78.3 −3.3	16.20 +.02	60.7 −2.0	5.77 +.03	59.3 −0.2
25.0	20.18 .10	61.1 0.2	52.50 .19	74.9 3.5	16.23 .06	58.6 2.1	5.82 .07	59.5 0.2
35.0	20.30 +.15	60.9 +0.2	52.39 −.02	71.3 −3.6	16.31 +.10	56.5 −2.1	5.91 +.11	59.7 −0.2

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	δ Draconis.		τ Draconis.		δ Aquilæ.		κ Aquilæ.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	h m 19 12	+67° 27′	h m 19 17	+73° 8′	h m 19 19	+ 2° 53′	h m 19 30	− 7° 16′
	s	″	s	″	s	″	s	″
Jan. 1.0	28.49 −.07	59.1 −3.5	38.38 −.15	57.6 −3.5	49.00 +.08	34.6 −1.5	49.78 +.07	30.7 −0.9
11.0	28.48 +.04	55.5 3.6	38.30 −.01	54.1 3.6	49.09 .11	33.1 1.5	49.86 .10	31.5 0.8
21.0	28.57 .14	51.9 3.5	38.37 +.14	50.5 3.5	49.22 .14	31.6 1.4	49.99 .14	32.3 0.8
30.9	28.76 .24	48.5 3.3	38.58 .28	47.1 3.4	49.38 .16	30.3 1.3	50.14 .17	33.1 0.7
Feb. 9.9	29.06 .24	45.3 3.0	38.92 .40	43.8 3.1	49.55 .19	29.1 1.1	50.33 .20	33.7 0.6
19.9	29.44 +.42	42.4 −2.6	39.38 +.52	40.9 −2.7	49.77 +.23	28.1 −0.9	50.54 +.22	34.2 −0.4
29.9	29.90 .49	40.0 2.1	39.96 .62	38.4 2.2	50.01 .25	27.3 0.6	50.77 .24	34.5 −0.2
Mar. 10.8	30.42 .54	38.2 1.5	40.61 .69	36.5 1.6	50.26 .26	26.9 −0.3	51.02 .26	34.6 0.0
20.8	30.98 .58	37.0 0.9	41.34 .74	35.2 1.0	50.53 .27	26.7 0.0	51.29 .27	34.4 +0.3
30.8	31.59 .61	36.4 −0.2	42.10 .77	34.5 −0.3	50.81 .28	26.9 +0.3	51.57 .28	34.0 0.5
Apr. 9.8	32.19 +.60	36.5 +0.4	42.88 +.77	34.5 +0.3	51.09 +.28	27.4 +0.7	51.86 +.29	33.4 +0.7
19.7	32.79 .58	37.3 1.1	43.65 .75	35.2 0.9	51.38 .29	28.3 1.0	52.16 .29	32.6 0.9
29.7	33.36 .55	38.7 1.6	44.38 .70	36.4 1.5	51.67 .28	29.4 1.2	52.45 .29	31.6 1.1
May 9.7	33.89 .50	40.6 2.1	45.06 .64	38.3 2.1	51.95 .27	30.7 1.4	52.74 .28	30.5 1.2
19.6	34.36 .44	42.9 2.6	45.66 .55	40.6 2.5	52.22 .25	32.2 1.5	53.02 .27	29.3 1.2
29.6	34.76 +.36	45.7 +2 9	46.16 +.45	43.3 +2.9	52.46 +.23	33.8 +1.6	53.28 +.25	28.1 +1.3
June 8.6	35.08 .27	48.8 3.2	46.56 .34	46.3 3.1	52.69 .21	35.5 1.7	53.52 .23	26.8 1.2
18.6	35.31 .18	52.1 3.4	46.84 .22	49.6 3.3	52.88 .18	37.1 1.7	53.74 .19	25.6 1.2
28.5	35.44 +.08	55.5 3.4	47.00 +.09	53.0 3.4	53.04 .15	38.8 1.6	53.91 .16	24.4 1.1
July 8.5	35.48 −.01	59.0 3.4	47.02 −.04	56.4 3.4	53.17 .11	40.3 1.5	54.05 .12	23.4 1.0
18.5	35.41 −.11	62.4 +3.3	46.91 −.17	59.8 +3.3	53.24 +.05	41.8 +1.4	54.15 +.07	22.5 +0.8
28.5	35.25 .21	65.6 3.1	46.68 .29	63.0 3.2	53.27 +.01	43.1 1.2	54.20 +.03	21.8 0.7
Aug. 7.4	35.00 .30	68.6 2.9	46.32 .41	66.1 2.9	53.27 −.04	44.2 1.0	54.21 −.01	21.2 0.5
17.4	34.65 .38	71.4 2 6	45.85 .52	68.9 2.6	53.22 .07	45.1 0.8	54.18 .06	20.7 0.4
27.4	34.24 .45	73.8 2.2	45.29 .61	71.4 2.3	53.13 .11	45.8 0.6	54.10 .09	20.4 0.2
Sept. 6.3	33.75 −.51	75.8 +1.8	44.63 −.69	73.5 +1.9	53.01 −.13	46.4 +0.4	53.99 −.12	20.3 +0.1
16.3	33.21 .56	77.3 1.3	43.91 .75	75.1 1.4	52.86 .16	46.7 +0.2	53.85 .15	20.3 0.0
26.3	32.63 .59	78.4 0.8	43.13 .79	76.3 0.9	52.69 .17	46.8 0.0	53.69 .16	20.3 −0.1
Oct. 6.3	32.03 .60	79.0 +0.3	42.32 .82	77.0 +0.4	52.51 .18	46.7 −0.2	53.52 .17	20.5 0.3
16.2	31.43 .60	79.0 −0.2	41.50 .82	77.2 −0.1	52.34 .17	46.5 0.4	53.35 .17	20.9 0.4
26.2	30.84 −.58	78.4 −0.8	40.69 −.79	76.7 −0.7	52.18 −.16	46.0 −0.6	53.19 −.16	21.3 −0.4
Nov. 5.2	30.27 .54	77.3 1.4	39.91 .75	75.8 1.2	52.03 .14	45.3 0.8	53.04 .13	21.8 0.5
15.2	29.76 .48	75.7 1.9	39.19 .68	74.3 1.8	51.91 .11	44.5 0.9	52.92 .11	22.3 0.6
25.1	29.30 .41	73.6 2.4	38.55 .60	72.3 2.3	51.82 .07	43.4 1.1	52.83 .07	23.0 0.7
Dec. 5.1	28.93 .33	71.0 2.8	38.00 .49	69.8 2.7	51.77 −.03	42.2 1.3	52.77 −.03	23.7 0.8
15.1	28.64 −.24	68.0 −3.1	37.56 −.37	66.9 −3.1	51.75 +.01	40.9 −1.4	52.76 +.01	24.5 −0.8
25.0	28.45 .14	64.7 3.4	37.25 .24	63.6 3.4	51.79 .05	39.5 1.4	52.79 .05	25.4 0.9
35.0	28.37 −.04	61.2 −3.6	37.08 −.10	60.2 −3.5	51.86 +.09	38.0 −1.5	52.85 +.08	26.2 −0.9

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	γ Aquilæ.		α Aquilæ. (*Altair.*)		ε Draconis.		β Aquilæ.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 19 40	° ′ +10 20	h m 19 45	° ′ + 8 34	h m 19 48	° ′ +69 58	h m 19 49	° ′ + 6 7
	s	″	s	″	s	″	s	″
Jan. 1.0	54.09+ .04	30.3 −1.8	17.12 +.04	25.9 −1.7	29.61 −.19	66.4 −3.3	46.69 +.04	41.6 −1.5
11.0	54.15 .08	28.5 1.8	17.18 .08	24.2 1.7	29.48 −.07	63.0 3.5	46.74 .08	40.0 1.6
21.0	54.25 .12	26.7 1.8	17.28 .11	22.5 1.7	29.47 +.05	59.4 3.5	46.84 .11	38.5 1.5
31.0	54.39 .15	24.9 1.6	17.41 .15	20.9 1.6	29.57 .16	55.9 3.4	46.97 .14	37.0 1.4
Feb. 9.9	54.55 .18	23.4 1.4	17.57 .18	19.4 1.3	29.80 .28	52.6 3.2	47.12 .17	35.6 1.2
19.9	54.74 +.20	22.0 −1.2	17.76 +.20	18.2 −1.1	30.13 +.38	49.5 −2.9	47.31 +.20	34.5 −1.0
29.9	54.96 .23	21.0 0.9	17.98 .23	17.2 0.8	30.56 .47	46.8 2.4	47.52 .22	33.6 0.7
Mar. 10.9	55.20 .25	20.3 0.5	18.21 .25	16.6 0.5	31.07 .55	44.6 1.9	47.76 .24	33.1 −0.4
20.8	55.46 .27	20.0 −0.1	18.47 .26	16.3 −0.1	31.66 .61	42.9 1.3	48.01 .26	32.9 0.0
30.8	55.73 .28	20.0 +0.3	18.74 .28	16.4 +0.3	32.29 .65	41.9 0.7	48.28 .27	33.0 +0.3
Apr. 9.8	56.01 +.29	20.5 +0.6	19.02 +.29	16.9 +0.7	32.95 +.66	41.5 −0.1	48.56 +.28	33.5 +0.6
19.8	56.30 .29	21.3 1.0	19.31 .29	17.7 1.0	33.62 .66	41.8 +0.6	48.85 .29	34.3 1.0
29.7	56.59 .29	22.4 1.3	19.60 .29	18.9 1.3	34.27 .64	42.7 1.2	49.14 .29	35.4 1.3
May 9.7	56.88 .28	23.9 1.6	19.89 .28	20.4 1.6	34.90 .60	44.2 1.8	49.42 .28	36.8 1.5
19.7	57.16 .27	25.6 1.8	20.17 .27	22.0 1.8	35.47 .54	46.3 2.3	49.70 .27	38.4 1.7
29.6	57.42 +.25	27.5 +1.9	20.44 +.25	23.9 +1.9	35.98 +.47	48.8 +2.7	49.97 +.26	40.1 +1.8
June 8.6	57.65 .22	29.5 2.0	20.68 .23	25.8 2.0	36.40 .39	51.6 3.0	50.21 .23	42.0 1.9
18.6	57.86 .19	31.5 2.1	20.89 .20	27.8 2.0	36.73 .28	54.8 3.3	50.43 .20	43.8 1.9
28.6	58.03 .15	33.6 2.0	21.07 .16	29.8 1.9	36.96 .18	58.2 3.4	50.61 .16	45.7 1.8
July 8.5	58.17 .11	35.5 1.9	21.21 .12	31.7 1.9	37.09 +.07	61.6 3.5	50.76 .12	47.5 1.7
18.5	58.26 +.07	37.4 +1.8	21.31 +.08	33.5 +1.7	37.10 −.04	65.1 +3.5	50.86 +.08	49.2 +1.6
28.5	58.31 +.03	39.2 1.6	21.36 +.03	35.2 1.6	37.00 .15	68.5 3.4	50.92 +.04	50.7 1.4
Aug. 7.4	58.31 −.02	40.7 1.4	21.37 −.01	36.7 1.4	36.79 .26	71.8 3.2	50.94 −.01	52.0 1.3
17.4	58.28 .06	42.1 1.2	21.34 .05	37.9 1.2	36.49 .35	74.9 2.9	50.91 .05	53.2 1.1
27.4	58.20 .10	43.2 1.0	21.27 .09	39.0 1.0	36.08 .44	77.7 2.6	50.84 .09	54.1 0.8
Sept. 6.4	58.08 −.13	44.1 +0.7	21.16 −.12	39.8 +0.7	35.60 −.52	80.2 +2.3	50.74 −.12	54.9 +0.6
16.3	57.94 .15	44.7 0.5	21.02 .15	40.4 0.5	35.04 .58	82.2 1.8	50.61 .14	55.4 0.4
26.3	57.78 .17	45.0 +0.2	20.86 .17	40.8 +0.2	34.43 .63	83.8 1.4	50.45 .16	55.6 +0.1
Oct. 6.3	57.60 .18	45.1 0.0	20.69 .17	40.8 0.0	33.78 .65	85.0 0.9	50.28 .17	55.6 −0.1
16.3	57.42 .18	45.0 −0.3	20.52 .17	40.7 −0.3	33.12 67	85.6 +0.3	50.11 .17	55.4 0.3
26.2	57.25 −.17	44.5 −0.6	20.35 −.16	40.3 −0.5	32.44 −.67	85.6 −0.2	49.94 −.16	55.0 −0.5
Nov. 5.2	57.09 .15	43.8 0.8	20.19 .15	39.6 0.8	31.78 .64	85.1 0.8	49.79 .14	54.4 0.7
15.2	56.95 .12	42.9 1.1	20.06 .12	38.8 1.0	31.16 .60	84.0 1.3	49.65 .12	53.6 0.9
25.2	56.85 .09	41.7 1.3	19.95 .09	37.7 1.2	30.59 .53	82.4 1.9	49.54 .09	52.5 1.1
Dec. 5.1	56.77 .06	40.3 1.5	19.88 .05	36.4 1.4	30.09 .46	80.3 2.4	49.47 .06	51.3 1.3
15.1	56.74 −.02	38.8 −1.7	19.84 −.02	34.9 −1.6	29.68 −.36	77.6 −2.8	49.43 −.02	49.9 −1.4
25.1	56.74 +.02	37.0 1.8	19.84 +.02	33.3 1.7	29.36 .26	74.7 3.1	49.43 +.02	48.4 1.5
35.1	56.78 +.06	35.2 −1.8	19.88 +.06	31.6 −1.7	29.16 −.15	71.4 −3.4	49.47 +.05	46.8 −1.6

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	τ Aquilæ.		a^2 Capricorni.		κ Cephei.		α Pavonis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	h m 19 58	° ′ + 6 57	h m 20 11	° ′ −12 53	h m 20 12	° ′ +77 22	h m 20 16	° ′ −57 5
	s	″	s	″	s	″	s	″
Jan. 1.1	38.17 +.03	46.9 −1.5	48.24 +.04	29.4 −0.4	34.64− .46	35.9 −3.1	43.53 +.02	39.5 +2.1
11.0	38.22 .07	45.4 1.6	48.30 .07	29.8 0.4	34.27 .29	32.7 3.3	43.60 .08	37.3 2.2
21.0	38.30 .10	43.8 1.5	48.38 .10	30.2 0.3	34.08− .10	29.3 3.4	43.72 .15	35.0 2.3
31.0	38.42 .13	42.3 1.4	48.50 .14	30.4 0.2	34.08+ .10	25.8 3.4	43.90 .21	32.7 2.3
Feb. 10.0	38.57 .16	40.9 1.3	48.65 .16	30.6 −0.1	34.28 .29	22.4 3.2	44.14 .27	30.3 2.3
19.9	38.75 +.19	39.8 −1.0	48.83 +.19	30.6 0.0	34.65+ .46	19.1 −3.1	44.44 +.32	28.1 +2.2
29.9	38.95 .22	38.9 0.7	49.04 .21	30.5 +0.2	35.20 .62	16.3 2.7	44.79 .37	25.9 2.1
Mar. 10.9	39.18 .24	38.3 0.4	49.27 .24	30.2 0.4	35.89 .76	13.8 2.2	45.18 .41	23.8 2.0
20.8	39.43 .26	38.1 −0.1	49.52 .26	29.7 0.6	36.71 .87	11.8 1.7	45.61 .45	22.0 1.8
30.8	39.69 .27	38.2 +0.3	49.79 .28	29.0 0.8	37.63 .94	10.4 1.1	46.08 .48	20.3 1.5
Apr. 9.8	39.97 +.28	38.7 +0.6	50.08 +.29	28.2 +0.9	38.60+1.00	9.7 −0.4	46.56 +.50	18.9 +1.3
19.8	40.26 .29	39.5 1.0	50.37 .30	27.2 1.1	39.61 1.00	9.6 +0.2	47.07 .51	17.8 1.0
29.7	40.55 .29	40.7 1.3	50.68 .31	26.1 1.2	40.61 .98	10.1 0.8	47.58 .51	17.0 0.7
May 9.7	40.84 .29	42.1 1.5	50.98 .30	24.9 1.2	41.57 .93	11.2 1.4	48.10 .51	16.5 +0.3
19.7	41.12 .28	43.7 1.7	51.29 .30	23.7 1.2	42.46 .85	12.9 1.9	48.60 .50	16.3 0.0
29.7	41.39 +.26	45.5 +1.8	51.58 +.28	22.4 +1.2	43.26+ .74	15.1 +2.4	49.09 +.47	16.5 −0.4
June 8.6	41.64 .24	47.4 1.9	51.85 .26	21.3 1.1	43.94 .61	17.7 2.8	49.54 .43	17.1 0.7
18.6	41.86 .21	49.3 1.9	52.10 .23	20.1 1.0	44.48 .47	20.7 3.1	49.96 .39	18.0 1.1
28.6	42.05 .17	51.2 1.9	52.31 .20	19.1 0.9	44.88 .31	23.9 3.3	50.34 .33	19.2 1.4
July 8.5	42.21 .13	53.1 1.8	52.49 .16	18.3 0.8	45.11+ .14	27.3 3.4	50.62 .26	20.7 1.6
18.5	42.32 +.09	54.9 +1.7	52.63 +.12	17.6 +0.6	45.17− .02	30.8 +3.5	50.85 +.19	22.4 −1.8
28.5	42.39 +.05	56.5 1.5	52.73 .07	17.1 0.4	45.06 .19	34.2 3.4	51.00 .11	24.4 2.0
Aug. 7.5	42.41 .00	57.9 1.3	52.78 +.03	16.7 0.3	44.79 .35	37.7 3.3	51.08 +.04	26.4 2.1
17.4	42.39 −.04	59.1 1.2	52.78 −.02	16.5 +0.1	44.35 .50	40.9 3.2	51.07 −.04	28.5 2.1
27.4	42.33 .08	60.2 0.9	52.74 .06	16.5 0.0	43.77 .64	44.0 2.9	50.99 .12	30.6 2.0
Sept. 6.4	42.23 −.11	61.0 +0.7	52.66 −.10	16.6 −0.1	43.06− .77	46.7 +2.6	50.84 −.18	32.6 −1.9
16.4	42.10 .14	61.5 0.4	52.55 .13	16.8 0.2	42.22 .88	49.1 2.2	50.63 .24	34.4 1.7
26.3	41.95 .16	61.9 +0.2	52.41 .15	17.1 0.3	41.30 .97	51.2 1.8	50.36 .28	35.9 1.4
Oct. 6.3	41.79 .17	61.9 0.0	52.25 .16	17.4 0.4	40.29 1.03	52.7 1.3	50.06 .31	37.1 1.0
16.3	41.61 .17	61.8 −0.3	52.08 .17	17.8 0.4	39.23 1.07	53.8 0.8	49.74 .32	37.9 0.6
26.2	41.44 −.16	61.4 −0.5	51.92 −.16	18.3 −0.5	38.15−1.08	54.3 +0.2	49.42 −.32	38.4 −0.2
Nov. 5.2	41.29 .15	60.8 0.7	51.76 .15	18.7 0.5	37.08 1.06	54.3 −0.3	49.11 .30	38.3 +0.2
15.2	41.15 .12	60.0 0.9	51.63 .12	19.2 0.5	36.03 1.02	53.7 0.9	48.82 .26	37.9 0.6
25.2	41.04 .10	59.0 1.1	51.52 .09	19.7 0.5	35.04 .94	52.5 1.5	48.58 .21	37.1 1.0
Dec. 5.1	40.96 .06	57.8 1.3	51.44 .06	20.2 0.5	34.14 .84	50.7 2.0	48.40 .16	35.9 1.4
15.1	40.91 −.03	56.4 −1.4	51.39 −.02	20.7 −0.5	33.36− .71	48.5 −2.4	48.27 −.09	34.3 +1.7
25.1	40.90 +.01	54.9 1.5	51.39 +.01	21.1 0.4	32.71 .56	45.8 2.9	48.21 −.02	32.5 2.0
35.1	40.93 +.05	53.4 −1.6	51.42 +.05	21.6 −0.4	32.23− .40	42.8 −3.2	48.22 +.05	30.4 +2.2

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	γ Cygni.		π Capricorni.		ε Delphini.		Groombridge 3241.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 20 18	° ′ +39 53	h m 20 20	° ′ −18 34	h m 20 27	° ′ +10 55	h m 20 30	° +72 8
	s	″	s	″	s	″	s	″
Jan. 1.1	10.69 −.05	61.3 −2.8	52.39 +.03	43.6 −0.1	49.86 .00	25.9 −1.6	26.05 −.34	78.6 −3.0
11.0	10.66 .00	58.4 2.9	52.43 .06	43.6 0.0	49.87 +.04	24.2 1.7	25.77 .22	75.5 3.2
21.0	10.69 +.05	55.4 3.0	52.51 .10	43.6 +0.1	49.93 .07	22.5 1.7	25.61 −.09	72.1 3.4
31.0	10.77 .10	52.5 2.9	52.63 .13	43.5 0.2	50.01 .10	20.8 1.6	25.59 +.04	68.6 3.4
Feb. 10.0	10.89 .14	49.6 2.7	52 78 .16	43.3 0.3	50.13 .13	19.3 1.4	25.70 .17	65.2 3.3
19.9	11.05 +.18	47.0 −2.4	52.95 +.19	42.9 +0.4	50.28 +.16	18.0 −1.2	25.94 +.30	61.9 −3.1
29.9	11.26 .22	44.8 2.1	53.16 .22	42.5 0 5	50.46 .19	16.9 0.9	26.30 .42	58.9 2.8
Mar. 10.9	11.50 .26	42.9 1.6	53.39 .24	41.9 0.7	50.67 .22	16 2 0.6	26.77 .52	56.4 2.3
20.9	11.77 .29	41.6 1.1	53.64 .26	41.2 0.8	50.90 .24	15.8 −0.2	27.33 .60	54.3 1.8
30.8	12.08 .31	40.8 −0.5	53.92 .28	40.3 0.9	51.15 .26	15.8 +0.2	27 97 .67	52.7 1.2
Apr. 9.8	12.40 +.33	40.5 +0.1	54.21 +.30	39.3 +1.0	51.42 +.28	16.1 +0.6	28.67 +.71	'51.8 −0.6
19.8	12.74 .34	40.9 0.6	54.51 .31	38.2 1.1	51.70 .29	16.9 0.9	29.40 .73	51.5 +0.1
29.8	13.09 .34	41.8 1.2	54.83 .31	37.1 1.2	52.00 .29	18.0 1.3	30.14 .73	51.9 0.7
May 9.7	13.43 .34	43.3 1.7	55.14 .31	35.9 1.2	52.29 .29	19.4 1.5	30.86 .71	52.9 1.3
19.7	13.76 .32	45.1 2.1	55.46 .31	34.8 1.1	52.59 .29	21.1 1.8	31.55 .66	54.5 1.8
29.7	14.07 +.30	47.5 +2.5	55.76 +.29	33.7 +1.1	52.87 +.27	23.0 +2.0	32.18 +.59	56.5 +2.3
June 8.6	14.36 .27	50.1 2.7	56.04 .27	32.6 1.0	53.14 .25	25.0 2.1	32.73 .51	59.1 2.7
18.6	14.61 .23	53.0 3.0	56.30 .25	31.7 0.8	53.38 .23	27.1 2.1	33.20 .41	62.0 3.0
28.6	14.81 .19	56.0 3.1	56.54 .21	31.0 0.6	53.59 .19	29.3 2.1	33.56 .31	65.1 3.3
July 8.6	14.98 .14	59.1 3.1	56.73 .17	30.4 0.5	53.77 .16	31.4 2.1	33.81 .19	68.5 3 5
18.5	15.09 +.09	62.3 +3.1	56.88 +.13	30.0 +0.3	53.90 +.11	33.4 +2.0	33.94 + 07	72.1 +3.5
28.5	15.15 +.03	65.3 3.0	56.99 .09	29.8 +0.1	54.00 .07	35.3 1.8	33.95 −.05	75.6 3.5
Aug. 7.5	15.15 −.02	68.3 2.8	57.06 +.04	29.8 0.0	54.04 +.03	37.0 1.6	33.83 .17	79.1 3.4
17.4	15.10 .07	71.0 2.6	57.07 −.01	29.9 −0.2	54.05 −.02	38.6 1.4	33.60 .29	82.5 3.3
27.4	15.00 .12	73.5 2.3	57.04 .05	30.2 0.3	54.01 .06	39.9 1.2	33.26 .39	85.7 3.1
Sept. 6.4	14.86 −.16	75.6 +2.0	56.96 −.09	30.5 −0.4	53.93 −.10	40.9 +0.9	32.82 −.49	88.6 +2.8
16.4	14.68 .20	77.5 1.6	56.85 .12	31.0 0.5	53.82 .13	41.8 0.7	32.29 .57	91.2 2.4
26.3	14.46 .22	78.9 1.2	56.71 .15	31.5 0.5	53.68 .15	42.3 0.4	31.68 .64	93.4 2.0
Oct. 6.3	14.23 .24	79.9 0.8	56.56 .16	32.0 0.5	53.52 .16	42.6 +0.2	31.00 .69	95.2 1.5
16.3	13.98 .25	80.4 +0.3	56.39 .17	32.5 0.5	53.35 .17	42.6 −0.1	30.29 .72	96.4 1.0
26.2	13.73 −.25	80.5 −0.2	56.22 −.16	33.0 −0.5	53.18 −.17	42.4 −0.4	29.55 −.74	97.2 +0.4
Nov. 5.2	13.49 .24	80.1 0.6	56.06 .15	33.4 0.4	53.02 .16	41.9 0.6	28.81 .73	97.3 −0.1
15.2	13.26 .22	79.3 1.1	55.92 .13	33.8 0.4	52.87 .14	41.2 0.8	28.09 .71	96.9 0.7
25.2	13.06 .19	77.9 1.6	55.80 .10	34.2 0.3	52.74 .11	40.2 1.1	27.40 .66	96.0 1.3
Dec. 5.1	12.89 .15	76.1 2.0	55.71 .07	34.5 0.2	52.64 .09	39.0 1.3	26.77 .60	94.4 1.8
15.1	12.76 −.11	74.0 −2.3	55.66 −.03	34.7 −0.2	52.57 −.05	37.6 −1.5	26.21 −.51	92.3 −2.3
25.1	12.66 .07	71.5 2.6	55.65 +.01	34.8 0.1	52.54 −.02	36.1 1.6	25.75 .41	89.8 2.7
35.1	12.62 −.02	68.7 −2.9	55.67 +.05	34.9 −0.1	52.54 +.02	34.4 −1.7	25.39 −.30	86.9 −3.0

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Cygni.		μ Aquarii.		12 Year Cat. 1879.		ν Cygni.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 20 37	+44° 52′	h m 20 46	− 9° 23′	h m 20 52	+80° 7′	h m 20 52	+40° 43′
	s	″	s	″	s	″	s	″
Jan. 1.1	34.94 −.08	57.0 −2.7	34.74 .00	72.9 −0.6	34.46− .80	66.6 −2.7	58.07 −.09	77.9 −2.6
11.1	34.89 −.03	54.2 3.0	34.76 +.03	73.4 0.5	33.77 .59	63.7 3.0	58.00 −.04	75.2 2.8
21.0	34.88 +.02	51.1 3.1	34.81 .06	73.9 0.5	33.39 .36	60.5 3.3	57.99 +.01	72.4 2.9
31.0	34.92 .07	48.1 3.0	34.89 .10	74.4 0.3	33.04− .12	57.2 3.4	58 02 .05	69.5 2.9
Feb. 10.0	35.02 .12	45.1 2.9	35.00 .13	74.6 −0.2	33.05+ .12	53.8 3.4	58.09 .10	66.6 2.8
20.9	35.16 +.17	42.3 −2.6	35.15 +.16	74.7 0.0	33.29+ .36	50.4 −3.2	58.21 +.14	64.0 −2.5
29.9	35.35 .21	39.8 2.3	35.32 .18	74.7 +0.2	33.76 .58	47.3 3.0	58.38 .19	61.5 2.2
Mar. 10.9	35.59 .26	37.7 1.8	35.52 .21	74.4 0.4	34.46 .79	44.5 2.6	58.59 .23	59.5 1.8
20.9	35.86 .29	36.1 1.3	35.74 .24	73.9 0.6	35.34 .96	42.2 2.1	58.84 .27	57.9 1.3
30.8	36.17 .32	35.0 0.8	35.99 .26	73.2 0.8	36.37 1.10	40.3 1.6	59.12 .30	56.9 0.8
Apr. 9.8	36.51 +.34	34.5 −0.2	36.26 +.28	72.4 +1.0	37.52+1.19	39.0 −1.0	59.43 +.32	56.4 −0.2
19.8	36.86 .36	34.6 +0.4	36.54 .29	71.3 1.2	38.75 1.24	38.3 −0.3	59.76 .34	56.4 +0.3
29.8	37.22 .37	35.3 1.0	36.84 .30	70.0 1.3	40.01 1.25	38.3 +0.3	60.11 .35	57.0 0.9
May 9.7	37.59 .36	36.6 1.5	37.14 .30	68.6 1.4	41.26 1.22	38.9 0.9	60.46 .35	58.2 1.4
19.7	37.95 .35	38.3 2.0	37.45 .30	67.2 1.5	42.46 1.15	40.0 1.4	60.81 .34	59.8 1.9
29.7	38.29 +.33	40.5 +2.4	37.75 +.29	65.7 +1.5	43.56+1.05	41.8 +2.0	61.14 +.32	61.9 +2.3
June 8.7	38.60 .30	43.1 2.7	38.03 .28	64.2 1.4	44.55 .91	44.0 2.4	61.46 .30	64.4 2.6
18.6	38.88 .26	45.9 3.0	38.30 .25	62.8 1.4	45.39 .75	46.6 2.8	61.74 .27	67.1 2.9
28.6	39.12 .21	49.0 3.1	38.54 .22	61.5 1.2	46.05 .57	49.6 3.1	61.99 .22	70.1 3.0
July 8.6	39.31 .16	52.2 3.2	38.75 .19	60.3 1.1	46.52 .37	52.8 3.3	62.19 .18	73.2 3.1
18.5	39.44 +.11	55.5 +3.3	38.91 +.15	59.4 +0.9	46.80 +.17	56.3 +3.5	62.34 +.13	76.4 +3.2
28.5	39.52 +.05	58.8 3.2	39.04 .10	58.5 0.7	46.86 −.04	59.8 3.5	62.44 .07	79.5 3.1
Aug. 7.5	39.54 −.01	61.9 3.1	39.12 .06	57.9 0.5	46.71 .25	63.3 3.5	62.49 +.02	82.6 3.0
17.5	39.50 .06	64.9 2.9	39.15 +.01	57.4 0.4	46.36 .45	66.8 3.4	62.48 −.03	85.5 2.8
27.4	39.41 .11	67.6 2.6	39.14 −.03	57.2 +0.2	45.81 .64	70.2 3.3	62.42 .08	88.2 2.6
Sept. 6.4	39.27 −.16	70.1 +2.3	39.09 −.07	57.1 0.0	45.08 −.81	73.3 +3.0	62.31 −.13	90.7 +2.3
16.4	39.09 .20	72.2 1.9	39.00 .10	57.2 −0.1	44.18 .97	76.2 2.7	62.17 .17	92.8 1.9
26.4	38.87 .23	74.0 1.5	38.88 .13	57.4 0.2	43.14 1.11	78.8 2.3	61.98 .20	94.6 1.6
Oct. 6.3	38.62 .25	75.3 1.1	38.74 .15	57.7 0.3	41.97 1.22	80.9 1.9	61.77 .22	95.9 1.1
16.3	38.36 .27	76.1 0.6	38.59 .16	58.1 0.4	40.71 1.30	82.6 1.4	61.53 .24	96.9 0.7
26.3	38.09 −.27	76.5 +0.2	38.43 −.16	58.6 −0.5	39.37−1.35	83.8 +0.9	61.29 −.24	97.4 +0.2
Nov. 5.2	37.82 .26	76.4 −0.4	38.28 .15	59.1 0.5	38.01 1.37	84.5 +0.4	61.05 .24	97.3 −0.3
15.2	37.56 .25	75.8 0.9	38.14 .13	59.6 0.6	36.64 1.35	84.5 −0.2	60.82 .23	96.8 0.7
25.2	37.32 .22	74.7 1.4	38.01 .11	60.2 0.6	35.31 1.29	84.0 0.8	60.60 .21	95.9 1.2
Dec. 5.2	37.12 .19	73.1 1.8	37.92 .08	60.8 0.6	34.05 1.20	82.9 1.4	60.41 .18	94.5 1.6
15.1	36.94 −.15	71.0 −2.2	37.85 −.05	61.4 −0.6	32.91−1.08	81.3 −1.9	60.24 −.14	92.6 −2.0
25.1	36.81 .11	68.6 2.6	37.82 −.02	62.0 0.6	31.90 .92	79.1 2.4	60.12 .11	90.4 2.4
35.1	36.73 −.06	65.9 −2.8	37.81 +.02	62.6 −0.6	31.07 −.72	76.5 −2.8	60.03 −.07	87.7 −2.7

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	61¹ Cygni.		ζ Cygni.		α Cephei.		1 Pegasi.	
	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.
	h m 21 1	° ′ +38 11	h m 21 8	° ′ +29 45	h m 21 15	° ′ +62 6	h m 21 16	° ′ +19 19
	s	″	s	″	s	″	s	″
Jan. 1.1	50.85 −.08	63.2 −2.4	8.44 −.06	69.5 −2.2	52.39 −.25	51.3 −2.6	52.70 −.05	35.5 −1.7
11.1	50.79 −.03	60.8 2.6	8.39 −.03	67.2 2.3	52.17 .18	48.5 2.9	52.66 −.02	33.7 1.9
21.1	50.78 +.01	58.1 2.7	8.38 +.01	64.8 2.4	52.03 .11	45.4 3.2	52.66 +.01	31.8 1.9
31.0	50.82 .05	55.4 2.7	8.41 .05	62.4 2.4	51.96 −.03	42.2 3.3	52.69 .05	29.8 1.9
Feb. 10.0	50.89 .10	52.8 2.6	8.47 .09	60.0 2.3	51.97 +.05	38.9 3.3	52.75 .08	28.0 1.8
20.0	51.01 +.14	50.3 −2.4	8.58 +.12	57.8 −2.1	52.06 +.13	35.6 −3.1	52.85 +.11	26.2 −1.6
29.9	51.18 .18	48.1 2.1	8.72 .16	55.8 1.8	52.23 .21	32.6 2.9	52.98 .15	24.8 1.3
Mar. 10.9	51.38 .22	46.2 1.7	8.90 .20	54.1 1.5	52.49 .29	29.9 2.5	53.15 .18	23.6 1.0
20.9	51.62 .26	44.7 1.2	9.11 .23	52.9 1.0	52.81 .36	27.5 2.1	53.34 .21	22.8 0.6
30.9	51.90 .29	43.8 0.7	9.36 .26	52.1 −0.5	53.20 .41	25.7 1.5	53.57 .24	22.4 −0.2
Apr. 9.8	52.21 +.32	43.4 −0.2	9.63 +.28	51.8 0.0	53.64 +.46	24.5 −0.9	53.82 +.26	22.4 +0.2
19.8	52.54 .34	43.5 +0.4	9.93 .30	52.0 +0.4	54.12 .49	23.8 −0.3	54.10 .28	22.8 0.7
29.8	52.88 .35	44.2 0.9	10.24 .32	52.7 0.9	54.62 .51	23.8 +0.3	54.39 .30	23.7 1.1
May 9.8	53.23 .35	45.4 1.4	10.56 .32	53.9 1.4	55.13 .51	24.4 0.9	54.70 .31	25.0 1.4
19.7	53.58 .35	47.1 1.9	10.88 .32	55.5 1.8	55.64 .50	25.6 1.5	55.00 .31	26.6 1.8
29.7	53.93 +.33	49.2 +2.3	11.19 +.31	57.5 +2.1	56.14 +.47	27.4 +2.0	55.31 +.30	28.5 +2.0
June 8.7	54.25 .31	51.7 2.6	11.50 .29	59.8 2.4	56.59 .43	29.6 2.4	55.60 .28	30.6 2.2
18.6	54.55 .28	54.4 2.9	11.77 .26	62.3 2.6	57.01 .38	32.3 2.8	55.88 .26	33.0 2.4
28.6	54.81 .24	57.4 3.0	12.02 .23	65.0 2.8	57.36 .32	35.3 3.1	56.13 .23	35.4 2.5
July 8.6	55.03 .20	60.5 3.2	12.23 .19	67.8 2.8	57.65 .25	38.5 3.4	56.34 .20	37.9 2.5
18.6	55.20 +.15	63.7 +3.2	12.40 +.15	70.7 +2.8	57.87 +.18	42.0 +3.5	56.52 +.16	40.3 +2.4
28.5	55.32 .10	66.9 3.1	12.53 .10	73.5 2.8	58.00 .10	45.5 3.6	56.65 .11	42.7 2.3
Aug. 7.5	55.39 +.04	70.0 3.0	12.60 +.05	76.2 2.6	58.06 +.02	49.1 3.5	56.75 .07	45.0 2.2
17.5	55.41 −.01	73.0 2.8	12.63 .00	78.7 2.4	58.04 −.06	52.6 3.4	56.79 +.02	47.1 2.0
27.4	55.38 .06	75.7 2.6	12.60 −.04	81.1 2.2	57.93 .14	56.0 3.3	56.79 −.02	49.0 1.8
Sept. 6.4	55 30 −.10	78.2 +2.3	12.54 −.08	83.2 +1.9	57.75 −.21	59.1 +3.0	56.75 −.06	50.6 +1.5
16.4	55.17 .14	80.4 2.0	12.43 .12	85.0 1.6	57.51 .28	62.0 2.7	56.67 .10	52.0 1.2
26.4	55.02 .17	82.2 1.6	12.29 .15	86.5 1.3	57.20 .33	64.6 2.4	56.55 .13	53.1 1.0
Oct. 6.3	54.83 .20	83.7 1.2	12.13 .17	87.6 1.0	56.85 .37	66.8 1.9	56.42 .15	53.9 0.7
16.3	54.62 .21	84.7 0.8	11.95 .19	88.4 0.6	56.45 .41	68.5 1.5	56.26 .16	54.4 +0.3
26.3	54.41 −.22	85.3 +0.4	11.75 −.19	88.7 +0.2	56.03 −.43	69.7 +0.9	56.10 −.17	54.6 0.0
Nov. 5.3	54.19 .21	85.4 −0.1	11.56 .19	88.7 −0.2	55.60 .43	70.4 +0.4	55.93 .16	54.5 −0.3
15.2	53.98 .20	85.1 0.5	11.37 .18	88.3 0.6	55.16 .43	70.5 −0.2	55.77 .16	54.0 0.6
25.2	53.78 .19	84.3 1.0	11.20 .16	87.4 1.0	54.74 .41	70.0 0.7	55.62 .14	53.2 0.9
Dec. 5.2	53.61 .16	83.1 1.4	11.04 .14	86.2 1.4	54.34 .38	69.0 1.3	55.48 .12	52.1 1.2
15.2	53.46 −.13	81.5 −1.8	10.91 −.11	84.6 −1.7	53.98 −.34	67.4 −1.8	55.37 −.10	50.8 −1.5
25.1	53.35 .09	79.5 2.2	10.81 .08	82.7 2.0	53.66 .29	65.3 2.3	55.29 .07	49.2 1.7
35.1	53.27 −.06	77.2 −2.4	10.74 −.05	80.6 −2.3	53.40 −.23	62.8 −2.7	55.24 −.04	47.5 −1.8

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	β Aquarii.		β Cephei.		ξ Aquarii.		ε Pegasi.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*
	h m 21 25	° ′ − 6 3	h m 21 27	° ′ +70 3	h m 21 31	° ′ − 8 21	h m 21 38	° ′ + 9 21
	s	″	s	″	s	″	s	″
Jan. 1.1	37.92 −.03	51.5 −0.7	10.49 −.41	81.0 −2.9	45.54 −.04	25.6 −0.6	39.47 −.06	43.1 −1.3
11.1	37.90 .00	52.2 0.6	10.13 .32	78.3 2.8	45.52 −.01	26.1 0.5	39.43 −.03	41.7 1.4
21.1	37.91 +.03	52.8 0.6	9.85 .22	75.3 3.1	45.52 +.02	26.6 0.4	39.42 .00	40.3 1.4
31.0	37.95 .05	53.3 0.4	9.69 −.11	72.1 3.3	45.56 .05	27.0 0.3	39.44 +.03	39.0 1.3
Feb. 10.0	38.02 .09	53.7 0.3	9.63 +.01	68.7 3.3	45.62 .08	27.2 −0.1	39.49 .06	37.7 1.2
20.0	38.13 +.12	53.9 −0.1	9.70 +.12	65.4 −3.3	45.72 +.11	27.3 0.0	39.57 +.10	36.6 −1.0
29.9	38.26 .15	53.9 +0.1	9.88 .24	62.2 3.1	45.85 .14	27.1 +0.2	39.68 .13	35.7 0.8
Mar. 10.9	38.42 .18	53.7 0.3	10.18 .34	59.3 2.7	46.00 .17	26.8 0.4	39.82 .16	35.0 0.5
20.9	38.61 .21	53.3 0.5	10.57 .44	56.7 2.3	46.19 .20	26.3 0.7	40.00 .19	34.7 −0.2
30.9	38.83 .23	52.6 0.8	11.06 .52	54.7 1.8	46.41 .23	25.5 0.9	40.21 .22	34.7 +0.2
Apr. 9.8	39.07 +.26	51.7 +1.0	11.62 +.59	53.2 −1.2	46.65 +.25	24.5 +1.1	40.44 +.25	35.0 +0.5
19.8	39.34 .28	50.6 1.2	12.24 .64	52.2 −0.6	46.91 .28	23.3 1.3	40.70 .27	35.7 0.8
29.8	39.63 .29	49.3 1.4	12.89 .66	51.9 0.0	47.20 .29	21.9 1.4	40.98 .29	36.7 1.2
May 9.8	39.93 .30	47.8 1.6	13.57 .67	52.2 +0.6	47.50 .30	20.4 1.6	41.27 .30	38.0 1.5
19.7	40.23 .30	46.2 1.6	14.24 .66	53.2 1.2	47.81 .31	18.8 1.6	41.57 .30	39.6 1.7
29.7	40.54 +.30	44.5 +1.7	14.88 +.62	54.7 +1.8	48.12 +.30	17.1 +1.7	41.88 +.30	41.4 +1.9
June 8.7	40.83 .29	42.8 1.7	15.49 .57	56.7 2.3	48.42 .29	15.4 1.6	42.17 .29	43.4 2.0
18.7	41.12 .27	41.2 1.6	16.03 .50	59.2 2.7	48.70 .28	13.8 1.6	42.45 .27	45.5 2.1
28.6	41.38 .25	39.6 1.5	16.50 .42	62.0 3.0	48.97 .25	12.3 1.5	42.72 .25	47.7 2.1
July 8.6	41.61 .21	38.1 1.4	16.88 .33	65.2 3.3	49.21 .22	10.9 1.3	42.95 .22	49.8 2.1
18.6	41.81 +.18	36.8 +1.2	17.16 +.22	68.6 +3.5	49.42 +.18	9.7 +1.1	43.15 +.18	51.9 +2.0
28.5	41.96 .14	35.7 1.0	17.34 .12	72.2 3.6	49.58 .14	8.7 0.9	43.31 .14	53.8 1.9
Aug. 7.5	42.08 .09	34.7 0.8	17.42 +.02	75.8 3.6	49.70 .10	7.9 0.7	43.43 .10	55.6 1.7
17.5	42.15 +.05	34.0 0.6	17.38 −.09	79.5 3.6	49.78 .05	7.3 0.5	43.50 .05	57.3 1.5
27.5	42.17 .00	33.5 0.4	17.24 .19	83.0 3.4	49.81 +.01	6.9 0.3	43.53 +.01	58.7 1.3
Sept. 6.4	42.15 −.04	33.2 +0.2	17.00 −.28	86.3 +3.2	49.80 −.03	6.7 +0.1	43.52 −.03	59.9 +1.1
16.4	42.10 .07	33.1 0.0	16.67 .37	89.4 3.0	49.75 .07	6.7 −0.1	43.47 .07	60.8 0.8
26.4	42.01 .10	33.2 −0.1	16.26 .45	92.3 2.6	49.67 .10	6.9 0.2	43.38 .10	61.5 0.6
Oct. 6.4	41.90 .12	33.4 0.3	15.77 .52	94.7 2.2	49.56 .12	7.2 0.4	43.27 .12	62.0 0.3
16.3	41.76 .14	33.7 0.4	15.23 .57	96.7 1.8	49.42 .14	7.6 0.5	43.14 .14	62.2 +0.1
26.3	41.62 −.14	34.1 −0.5	14.64 −.60	98.3 +1.3	49.28 −.14	8.1 −0.5	43.00 −.15	62.2 −0.1
Nov. 5.3	41.47 .14	34.6 0.6	14.03 .62	99.3 0.7	49.14 .14	8.7 0.6	42.85 .15	62.0 0.4
15.2	41.33 .14	35.3 0.6	13.41 .63	99.7 +0.1	49.00 .13	9.3 0.6	42.70 .14	61.5 0.6
25.2	41.20 .12	35.9 0.7	12.78 .61	99.5 −0.5	48.87 .12	9.9 0.6	42.57 .13	60.8 0.8
Dec. 5.2	41.09 .10	36.6 0.7	12.18 .58	98.8 1.0	48.75 .10	10.6 0.6	42.44 .11	60.0 1.0
15.2	41.00 −.08	37.3 −0.7	11.62 −.53	97.4 −1.6	48.66 −.08	11.2 −0.6	42.34 −.09	58.9 −1.1
25.1	40.94 .05	38.0 0.7	11.13 .46	95.6 2.1	48.60 .05	11.8 0.6	42.26 .07	57.7 1.2
35.1	40.90 −.02	38.7 −0.7	10.70 −.38	93.2 −2.6	48.56 −.02	12.4 −0.6	42.21 −.04	56.4 −1.3

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	11 Cephei.		μ Capricorni.		79 Draconis.		α Aquarii.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	h m 21 40	° ′ +70 47	h m 21 47	° ′ −14 4	h m 21 51	° ′ +73 10	h m 22 0	° ′ − 0 51
	s	″	s	″	s	″	s	″
Jan. 1.1	14.72 −.45	57.8 −2.3	9.51 −.04	48.8 −0.3	26.07 −.55	34.3 −2.1	0.23 −.06	52.1 −0.9
11.1	14.31 .36	55.3 2.7	9.47 −.02	49.1 0.2	25.56 .46	32.0 2.6	0.18 .03	52.9 0.8
21.1	13.99 .26	52.4 3.0	9.47 +.01	49.2 −0.1	25.16 .35	29.2 2.9	0.16 −.01	53.7 0.8
31.1	13.78 .15	49.2 3.2	9.49 .04	49.2 +0.1	24.87 .22	26.1 3.2	0.17 +.02	54.5 0.7
Feb. 10.0	13.69 −.03	45.9 3.3	9.55 .07	49.0 0.2	24.72 −.09	22.9 3.3	0.20 .05	55.1 0.6
20.0	13.72 +.09	42.6 −3.3	9.63 +.10	48.7 +0.4	24.70 +.05	19.5 −3.3	0.26 +.08	55.6 −0.4
Mar. 1.0	13.87 .21	39.3 3.1	9.75 .13	48.2 0.6	24.82 .19	16.3 3.2	0.36 .11	55.9 −0.2
10.9	14.13 .32	36.4 2.8	9.89 .16	47.5 0.8	25.08 .32	13.2 2.9	0.48 .14	55.9 +0.1
20.9	14.51 .43	33.7 2.4	10.07 .19	46.6 1.0	25.47 .45	10.5 2.5	0.64 .17	55.7 0.3
30.9	14.99 .52	31.5 1.9	10.28 .22	45.5 1.2	25.98 .55	8.1 2.1	0.83 .20	55.2 0.6
Apr. 9.9	15.55 +.59	29.9 −1.4	10.52 +.25	44.3 +1.3	26.58 +.64	6.3 −1.6	1.05 +.23	54.5 +0.9
19.8	16.17 .65	28.8 0.8	10.78 .27	42.9 1.5	27.27 .71	5.0 1.0	1.30 .26	53.5 1.1
29.8	16.84 .68	28.3 −0.2	11.06 .29	41.3 1.6	28.01 .76	4.3 −0.4	1.57 .28	52.2 1.4
May 9.8	17.53 .69	28.5 +0.4	11.36 .31	39.7 1.6	28.78 .78	4.3 +0.3	1.85 .29	50.7 1.6
19.8	18.23 .69	29.2 1.0	11.68 .31	38.0 1.7	29.56 .77	4.9 0.9	2.15 .30	49.0 1.7
29.7	18.91 +.66	30.5 +1.6	11.99 +.31	36.4 +1.6	30.33 +.75	6.0 +1.4	2.46 +.31	47.3 +1.8
June 8.7	19.55 .61	32.4 2.1	12.31 .31	34.8 1.6	31.06 .70	7.8 2.0	2.77 .30	45.4 1.9
18.7	20.13 .55	34.8 2.6	12.61 .29	33.3 1.4	31.72 .63	10.0 2.4	3.06 .28	43.5 1.9
28.6	20.64 .47	37.5 2.9	12.89 .27	31.9 1.3	32.31 .54	12.6 2.8	3.34 .26	41.6 1.8
July 8.6	21.06 .37	40.6 3.2	13.15 .24	30.7 1.1	32.81 .44	15.6 3.1	3.59 .24	39.9 1.7
18.6	21.39 +.27	44.0 +3.4	13.37 +.20	29.7 +0.9	33.20 +.33	18.9 +3.4	3.81 +.20	38.2 +1.6
28.6	21.61 .17	47.5 3.6	13.55 .16	29.0 0.6	33.47 .21	22.4 3.6	3.99 .16	36.7 1.4
Aug. 7.5	21.72 +.06	51.2 3.7	13.69 .12	28.4 0.4	33.63 +.09	26.0 3.7	4.13 .12	35.4 1.2
17.5	21.73 −.05	54.8 3.6	13.79 .07	28.2 +0.2	33.65 −.03	29.7 3.7	4.23 .08	34.3 1.0
27.5	21.62 .16	58.4 3.5	13.84 +.03	28.1 0.0	33.57 .14	33.4 3.6	4.29 +.03	33.5 0.8
Sept. 6.5	21.41 −.26	61.9 +3.3	13.84 −.02	28.2 −0.2	33.36 −.27	36.9 +3.4	4.30 −.01	32.8 +0.5
16.4	21.11 .35	65.1 3.1	13.81 .05	28.5 0.4	33.04 .37	40.2 3.2	4.27 .04	32.4 0.3
26.4	20.71 .44	68.0 2.8	13.73 .09	29.0 0.5	32.61 .47	43.3 2.9	4.21 .07	32.1 +0.1
Oct. 6.4	20.23 .51	70.7 2.4	13.63 .11	29.5 0.6	32.10 .55	46.1 2.5	4.12 .10	32.1 −0.1
16.3	19.70 .56	72.9 2.0	13.51 .13	30.2 0.7	31.51 .62	48.5 2.1	4.01 .12	32.3 0.2
26.3	19.11 −.61	74.6 +1.5	13.37 −.14	30.9 −0.7	30.85 −.68	50.4 +1.7	3.88 −.13	32.5 −0.4
Nov. 5.3	18.48 .63	75.8 0.9	13.23 .14	31.6 0.7	30.15 .72	51.8 1.1	3.75 .14	33.0 0.5
15.3	17.84 .64	76.4 +0.4	13.09 .14	32.2 0.6	29.42 .73	52.6 +0.6	3.61 .13	33.5 0.6
25.2	17.20 .63	76.5 −0.2	12.96 .13	32.9 0.6	28.68 .73	52.9 0.0	3.48 .13	34.2 0.7
Dec. 5.2	16.57 .61	75.9 0.8	12.84 .11	33.4 0.5	27.96 .71	52.6 −0.6	3.36 .11	34.9 0.7
15.2	15.99 −.56	74.8 −1.4	12.74 −.09	33.9 −0.4	27.26 −.67	51.6 −1.2	3.26 −.09	35.7 −0.8
25.1	15.45 .50	73.1 1.9	12.66 .06	34.3 0.4	26.62 .60	50.1 1.8	3.17 .07	36.5 0.8
35.1	14.99 −.43	70.9 −2.5	12.62 −.03	34.6 −0.3	26.06 −.52	48.1 −2.3	3.11 −.05	37.4 −0 9

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Gruis.		θ Aquarii.		π Aquarii.		η Aquarii.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	h m 22 1	° ′ −47 29	h m 22 10	° ′ − 8 20	h m 22 19	° ′ + 0 48	h m 22 29	° ′ − 0 41
	s	″	s	″	s	″	s	″
Jan. 1.1	7.63 −.11	83.9 +1.2	53.73 −.07	31.8 −0.6	31.90 −.07	30.4 −0.9	34.57 −.08	44.2 −0.8
11.1	7.54 .07	82.5 1.5	53.67 .04	32.4 0.5	31.84 .05	29.5 0.9	34.49 .06	45.1 0.8
21.1	7.49 −.02	80.9 1.8	53.64 −.02	32.8 0.4	31.80 −.03	28.7 0.8	34.44 .03	45.8 0.7
31.1	7.49 +.02	78.9 2.0	53.64 +.01	33.1 0.2	31.79 .00	27.9 0.7	34.42 −.01	46.5 0.6
Feb. 10.0	7.54 .07	76.8 2.2	53.67 .04	33.3 −0.1	31.80 +.03	27.2 0.6	34.42 +.02	47.1 0.5
20.0	7.63 +.11	74.5 +2.4	53.72 +.07	33.3 +0.1	31.85 +.06	26.7 −0.4	34.46 +.05	47.6 −0.3
Mar. 1.0	7.77 .16	72.1 2.5	53.81 .10	33.1 0.3	31.92 .09	26.3 −0.2	34.52 .08	47.8 −0.1
11.0	7.95 .20	69.6 2.5	53.93 .13	32.7 0.5	32.03 .12	26.2 0.0	34.62 .11	47.8 +0.2
20.9	8.17 .25	67.1 2.5	54.09 .16	32.0 0.8	32.17 .16	26.3 +0.2	34.75 .15	47.6 0.4
30.9	8.44 .29	64.6 2.4	54 27 .20	31.1 1.0	32.34 .19	26.7 0.6	34.91 .18	47.1 0.6
Apr. 9.9	8.75 +.33	62.2 +2.3	54.48 +.23	30.0 +1.2	32.54 +.22	27.4 +0.8	35.11 +.21	46.3 +0.9
19.8	9.09 .36	59.9 2.2	54.73 .25	28.7 1.4	32.78 .25	28.4 1.1	35.34 .24	45.3 1 1
29.8	9.47 .39	57.8 2.0	54.99 .27	27.2 1.6	33.04 .27	29.6 1.3	35.59 .27	44.0 1.4
May 9.8	9.87 .41	55.9 1.7	55.28 .29	25.6 1.7	33.32 .29	31.1 1.6	35.87 .29	42.5 1.6
19.8	10.29 .42	54.3 1.5	55.60 .30	23.9 1.8	33.61 .30	32.8 1.7	36.17 .30	40.8 1.8
29.7	10.71 +.42	53.0 +1.1	55.90 +.31	22.1 +1.8	33.92 +.31	34.6 +1.9	36.47 +.31	39.0 +1.9
June 8.7	11.14 .41	52.0 0.8	56.21 .30	20.3 1.8	34.23 .30	36.5 1.9	36.78 .31	37.1 1.9
18.7	11.55 .40	51.5 +0 4	56.51 .29	18.6 1.7	34.53 .29	38.4 1.9	37.08 .30	35.1 1.9
28.7	11.94 .37	51.3 0.0	56.80 .27	16.9 1.6	34.81 .27	40.4 1.9	37.37 .28	33.2 1.9
July 8.6	12.29 .34	51.5 −0.4	57.07 .25	15.4 1.4	35.07 .25	42.2 1.8	37.64 .25	31.4 1.8
18.6	12.61 +.29	52.1 −0.8	57.30 +.21	14.0 +1.2	35.31 +.21	44.0 +1.7	37.88 +.22	29.7 +1.6
28.6	12.88 .24	53.0 1.1	57.50 .17	12.9 1.0	35.50 .18	45.6 1.5	38.09 .19	28.1 1.5
Aug. 7.5	13 08 .18	54.3 1.4	57.65 .13	12.0 0.8	35.66 .14	47.0 1.3	38.26 .15	26.7 1.3
17.5	13.23 .12	55.8 1.7	57.76 .09	11.3 0.6	35.78 .10	48.3 1.1	38.38 .11	25.6 1.0
27.5	13.31 +.05	57.6 1.8	57.83 +.05	10.9 0.3	35.85 .05	49.3 0.9	38.47 .06	24.6 0.8
Sept. 6.5	13.33 −.01	59.5 −2.0	57.85 .00	10.6 +0.1	35.88 +.01	50.0 +0.7	38.51 +.02	23.9 +0.6
16.4	13.29 .07	61 5 2.0	57.84 −.04	10.6 −0.1	35.88 −.02	50.6 0.5	38.51 −.02	23.5 0.4
26.4	13.19 .12	63.5 1.9	57.79 .07	10.8 0.3	35.83 .06	50.9 +0.2	38.48 .05	23.2 +0.2
Oct. 6.4	13.05 .16	65.4 1.8	57.71 .10	11.2 0.4	35.76 .09	51.1 0.0	38.41 .08	23.1 0.0
16.4	12.86 .20	67.1 1.6	57.60 .12	11.6 0.5	35.66 .11	51.0 −0.1	38.32 .10	23.3 −0.2
26.3	12.65 −.22	68.5 −1.3	57.48 −.13	12.2 −0.6	35.54 −.12	50.8 −0.3	38.21 −.11	23.6 −0.4
Nov. 5.3	12.43 .23	69.7 1.0	57.35 .14	12.8 0.7	35.42 .13	50.4 0.4	38.09 .12	24.0 0.5
15.3	12.20 .22	70.4 0.6	57.22 .13	13.5 0.7	35.29 .13	49.9 0.6	37.96 .13	24.5 0.6
25.2	11.98 .21	70.8 −0.2	57.09 .13	14.2 0.7	35.16 .13	49.3 0.7	37.84 .12	25.1 0.7
Dec. 5.2	11.78 .19	70.8 +0.2	56.97 .12	14.8 0.7	35.03 .11	48.5 0.8	37.72 .11	25.9 0.7
15.2	11.60 −.16	70.4 +0.6	56.87 −.10	15.5 −0.6	34.93 −.10	47.7 −0.8	37.61 −.10	26.6 −0.8
25.2	11.45 .13	69.7 1.0	56.78 .08	16.1 0.6	34.83 .08	46.9 0.9	37.51 .09	27.4 0.8
35.1	11.34 −.08	68.5 +1.3	56.72 −.06	16.7 −0.5	34 76 −.07	46.0 −0.9	37.43 −.07	28.2 −0.8

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	226 Cephei (B.)		ζ Pegasi.		ι Cephei.		λ Aquarii.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	h m 22 30	° ′ +75 38	h m 22 35	° ′ +10 14	h m 22 45	° ′ +65 36	h m 22 46	° ′ − 8 10
	s	″	s	″	s	″	s	″
Jan. 1.2	16.75 −.73	71.5 −1.6	51.20 −.09	48.1 −1.2	40.36 −.41	53.9 −1.4	44.81 −.09	38.0 −0.6
11.1	16.05 .64	69.6 2.1	51.12 .07	46.9 1.2	39.97 .37	52.1 2.0	44.73 .07	38.5 0.5
21.1	15.46 .53	67.2 2.6	51.06 .05	45.7 1.2	39.63 .31	49.9 2.5	44.67 .05	38.9 0.3
31.1	14.98 .40	64.5 2.9	51.02 −.02	44.5 1.2	39.36 .23	47.2 2.8	44.64 −.02	39.2 −0.2
Feb. 10.1	14.65 .26	61.4 3.1	51.02 +.01	43.3 1.1	39.17 .15	44.3 3.0	44.63 .00	39.3 0.0
20.0	14.47 −.10	58.2 −3.2	51.04 +.04	42.2 −1.0	39.05 −.06	41.2 −3.1	44.65 +.03	39.3 +0.2
Mar. 1.0	14.45 +.06	54.9 3.2	51.09 .07	41.3 0.8	39.04 +.03	38.1 3.1	44.70 .07	39.0 0.4
11.0	14.60 .23	51.8 3.1	51.18 .11	40.7 0.5	39.11 .12	35.0 2.9	44.78 .10	38.6 0.6
20.9	14.91 .38	48.8 2.8	51.30 .14	40.3 −0.2	39.29 .22	32.2 2.7	44.90 .13	37.9 0.8
30.9	15.37 .53	46.1 2.4	51.46 .18	40.2 +0.1	39.55 .31	29.6 2.3	45.05 .17	36.9 1.0
Apr. 9.9	15.96 +.65	43.9 −2.0	51.65 +.21	40.4 +0.4	39.91 +.38	27.5 −1.9	45.23 +.20	35.8 +1.3
19.9	16.67 .75	42.2 1.5	51.88 .24	41.0 0.7	40.33 .46	25.9 1.4	45.45 .23	34.4 1.5
29.8	17.47 .83	41.0 0.9	52.13 .27	41.9 1.1	40.82 .51	24.8 0.8	45.70 .26	32.9 1.6
May 9.8	18.33 .88	40.4 −0.3	52.41 .29	43.1 1.4	41.36 .55	24.2 −0.2	45.97 .28	31.2 1.8
19.8	19.22 .90	40.5 +0.3	52.71 .30	44.6 1.6	41.93 .58	24.3 +0.4	46.26 .30	29.3 1.9
29.8	20.13 +.89	41.1 +0.9	53.01 +.31	46.3 +1.8	42.51 +.58	25.0 +0.9	46.57 +.31	27.4 +1.9
June 8.7	21.01 .86	42.3 1.5	53.32 .31	48.3 2.0	43.09 .57	26.2 1.5	46.88 .31	25.5 1.9
18.7	21.85 .80	44.0 2.0	53.63 .30	50.3 2.1	43.65 .54	28.0 2.0	47.19 .31	23.7 1.8
28.7	22.61 .72	46.3 2.5	53.92 .28	52.5 2.2	44.17 .50	30.2 2.4	47.49 .29	21.9 1.7
July 8.6	23.29 .62	48.9 2.9	54.19 .26	54.6 2.2	44.65 .44	32.8 2.8	47.77 .27	20.3 1.6
18.6	23.86 +.51	52.0 +3.2	54.43 +.22	56.8 +2.1	45.06 +.38	35.8 +3.1	48.03 +.24	18.8 +1.4
28.6	24.31 .38	55.3 3.4	54.61 .19	58.8 2.0	45.40 .30	39.1 3.4	48.26 .21	17.5 1.1
Aug. 7.6	24.63 .25	58.8 3.6	54.81 .15	60.8 1.8	45.67 .22	42.5 3.5	48.45 .17	16.5 0.9
17.5	24.81 +.12	62.4 3.7	54.94 .11	62.5 1.7	45.85 .14	46.1 3.6	48.59 .13	15.7 0.7
27.5	24.86 −.02	66.1 3.7	55.02 .06	64.1 1.5	45.94 +.05	49.8 3.6	48.70 .08	15.2 0.4
Sept. 6.5	24.77 −.16	69.8 +3.6	55.07 +.02	65.5 +1.2	45.96 −.03	53.4 +3.5	48.76 +.04	14.9 +0.2
16.5	24.54 .29	73.4 3.5	55.07 −.01	66.6 1.0	45.89 .11	56.9 3.4	48.78 .00	14.9 −0.1
26.4	24.19 .41	76.9 3.3	55.04 .05	67.5 0.8	45.73 .19	60.2 3.2	48.76 −.03	15.0 0.2
Oct. 6.4	23.72 .52	80.0 3.0	54.97 .08	68.1 0.5	45.51 .26	63.2 2.9	48.71 .06	15.3 0.4
16.4	23.15 .62	82.9 2.6	54.89 .10	68.5 0.3	45.23 .31	66.0 2.6	48.63 .09	15.8 0.5
26.3	22.48 −.76	85.3 +2.2	54.77 −.12	68.7 +0.1	44.88 −.36	68.4 +2.1	48.53 −.11	16.4 −0.6
Nov. 5.3	21.74 .77	87.3 1.7	54.65 .13	68.6 −0.2	44.49 .41	70.3 1.7	48.42 .12	17.1 0.7
15.3	20.94 .82	88.8 1.2	54.52 .13	68.4 0.4	44.07 .44	71.7 1.2	48.30 .12	17.8 0.7
25.3	20.10 .84	89.7 +0.6	54.39 .13	67.9 0.6	43.62 .45	72.6 +0.6	48.17 .12	18.5 0.7
Dec. 5.2	19.25 .85	90.0 0.0	54.26 .12	67.2 0.8	43.16 .46	72.9 0.0	48.05 .12	19.2 0.7
15.2	18.40 −.83	89.7 −0.6	54.15 −.11	66.4 −0.9	42.70 −.45	72.6 −0.6	47.94 −.11	19.9 −0.7
25.2	17.59 .78	88.8 1.2	54.04 .10	65.4 1.0	42.25 .43	71.7 1.2	47.84 .09	20.6 0.6
35.2	16.84 −.70	87.2 −1.8	53.95 −.08	64.3 −1.2	41.83 −.39	70.3 −1.7	47.75 −.08	21.1 −0.5

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Piscis Australis. (*Fomalhaut.*)		α Pegasi. (*Markab.*)		o Cephei.		θ Piscium.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 22 51	° ′ −30 12	h m 22 59	° ′ +14 36	h m 23 13	° ′ +67 29	h m 23 22	° ′ + 5 45
	s	″	s	″	s	″	s	″
Jan. 1.2	25.84 −.11	69.6 +0.2	9.69 −.11	9.9 −1.2	60.90 −.47	69.2 −1.1	16.02 −.11	45.9 −0.9
11.2	25.75 .08	69.3 0.5	9.59 .09	8.7 1.2	60.45 .43	67.8 1.7	15.92 .09	45.0 0.9
21.1	25.68 .06	68.6 0.8	9.51 .07	7.4 1.3	60.03 .38	65.9 2.2	15.84 .08	44.1 0.9
31.1	25.63 −.03	67.7 1.0	9.45 .05	6.1 1.3	59.68 .31	63.5 2.5	15.77 .06	43.2 0.9
Feb. 10.1	25.62 .00	66.6 1.3	9.42 −.02	4.7 1.3	59.41 .23	60.8 2.8	15.72 .03	42.4 0.8
20.1	25.64 +.03	65.2 +1.5	9.42 +.01	3.5 −1.2	59.22 −.14	57.9 −3.0	15.70 −.01	41.7 −0.6
Mar. 1.0	25.69 .07	63.6 1.7	9.45 .05	2.4 1.0	59.12 −.04	54.8 3.1	15.71 +.02	41.1 0.5
11.0	25.77 .11	61.8 1.9	9.51 .08	1.5 0.8	59.13 +.06	51.7 3.0	15.75 .06	40.8 −0.3
21.0	25.90 .14	59.9 2.0	9.61 .12	0.8 0.5	59.25 .17	48.8 2.8	15.83 .09	40.7 0.0
30.9	26.06 .18	57.8 2.1	9.74 .16	0.5 −0.2	59.47 .27	46.1 2.5	15.94 .13	40.8 +0.3
Apr. 9.9	26.27 +.22	55.7 +2.2	9.92 +.19	0.4 +0.1	59.79 +.36	43.7 −2.1	16.09 +.17	41.2 +0.6
19.9	26.50 .25	53.4 2.2	10.13 .23	0.7 0.5	60.19 .45	41.8 1.7	16.28 .20	42.0 0.9
29.9	26.78 .28	51.2 2.2	10.37 .26	1.4 0.9	60.68 .52	40.3 1.2	16.50 .24	43.0 1.2
May 9.8	27.08 .31	49.0 2.1	10.64 .28	2.5 1.2	61.23 .57	39.5 −0.6	16.76 .27	44.3 1.4
19.8	27.40 .33	46.9 2.0	10.94 .30	3.8 1.5	61.82 .60	39.2 0.0	17.03 .29	45.8 1.6
29.8	27.74 +.35	45.0 +1.8	11.24 +.31	5.4 +1.8	62.44 +.62	39.5 +0.6	17.33 +.30	47.5 +1.8
June 8.8	28.09 .35	43.2 1.6	11.56 .31	7.3 2.0	63.07 .62	40.3 1.1	17.64 .31	49.4 1.9
18.7	28.44 .34	41.7 1.4	11.87 .30	9.4 2.1	63.68 .60	41.7 1.6	17.94 .31	51.4 2.0
28.7	28.78 .33	40.5 1.1	12.17 .29	11.5 2.2	64.27 .57	43.6 2.1	18.25 .30	53.5 2.0
July 8.7	29.10 .31	39 6 0.7	12.45 .27	13.8 2.3	64.82 .52	45.9 2.5	18.54 .28	55.5 2.0
18.6	29.39 +.28	39.0 +0.4	12.71 +.24	16.0 +2.2	65.31 +.46	48.7 +2.9	18.81 +.26	57.5 +1.9
28.6	29.65 .24	38.8 0.0	12.94 .21	18.3 2.2	65.74 .38	51.7 3.2	19.05 .23	59.4 1.8
Aug. 7.6	29.87 .20	39.0 −0.3	13.12 .17	20.4 2.1	66.08 .30	55.1 3.4	19.26 .19	61.2 1.7
17.6	30.04 .15	39.4 0.6	13.27 .13	22.4 1.9	66.35 .22	58.6 3.6	19.43 .15	62.8 1.5
27.5	30.17 .10	40.2 0.9	13.38 .09	24.2 1.7	66.52 .13	62.2 3.6	19.57 .11	64.1 1.3
Sept. 6.5	30.25 +.05	41.2 −1.1	13.45 +.05	25.8 +1.5	66.61 +.04	65.9 +3.6	19.66 +.07	65.3 +1.0
16.5	30.28 .00	42.4 1.3	13.48 +.01	27.2 1.3	66.61 −.04	69.5 3.5	19.71 + 03	66.2 0.8
26.4	30.26 −.04	43.7 1.4	13.46 −.03	28.4 1.1	66.52 .13	72.9 3.4	19.73 .00	66.9 0.6
Oct. 6.4	30.20 .07	45.2 1.5	13.42 .06	29.3 0.8	66.35 .22	76.2 3.2	19.71 −.03	67.3 0.4
16.4	30.11 .10	46.7 1.4	13.35 .08	30.0 0.5	66 11 .28	79.3 2.9	19.66 .06	67.6 +0.1
26.4	29.99 −.13	48.1 −1.4	13.25 −.10	30.4 +0.3	65.80 −.34	81.9 +2.5	19.59 −.08	67.6 −0.1
Nov. 5.3	29.85 .14	49.4 1.2	13.14 .12	30.6 0.0	65.43 .40	84.2 2.1	19.50 .10	67.4 0.2
15.3	29.71 .15	50.5 1.2	13.02 .13	30.5 −0.2	65.01 .44	86.1 1.6	19.39 .11	67.1 0.4
25.3	29.55 .15	51.4 0.8	12.89 .13	30.2 0.4	64.55 .47	87.4 1.0	19.28 .11	66.7 0.5
Dec. 5.3	29.40 .14	52.1 0.5	12.76 .13	29.7 0.6	64.07 .49	88.1 +0.4	19.16 .12	66.1 0.6
15.2	29.26 −.13	52.5 −0.3	12.64 −.12	28.9 −0.8	63.57 −.49	88.2 −0.2	19.05 −.11	65.4 −0.7
25.2	29.14 .12	52.6 0.0	12.52 .11	28.0 1.0	63.08 .48	87.8 0.7	18.93 .11	64.6 0.8
35.2	29.03 −.10	52.4 +0.3	12.42 −.10	26.9 −1.2	62.60 −.46	86.8 −1.3	18.83 −.10	63.7 −0.9

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ι Piscium.		γ Cephei.		Groombridge 4163.		ω Piscium.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 23 34	° ′ + 5 1	h m 23 34	° +77 0	h m 23 49	° +73 46	h m 23 53	° + 6 14
	s	″	s	″	s	″	s	″
Jan. 1.2	10.27 −.10	5.4 −0.9	44.71 −.89	40.3 −0.7	23.20 −.72	87.3 −0.5	32.62 −.11	31.4 −0.9
11.2	10.17 .10	4.5 0.9	43.83 .85	39.3 1.3	22.50 .67	86.5 1.1	32.51 .10	30.5 0.8
21.2	10.08 .08	3.6 0.8	43.02 .77	37.8 1.8	21.85 .62	85.0 1.7	32.40 .10	29.7 0.8
31.1	10.00 .07	2.8 0.8	42.30 .66	35.7 2.3	21.26 .54	83.1 2.2	32.31 .08	28.9 0.8
Feb. 10.1	9.94 .04	2.0 0.7	41.70 .53	33.1 2.7	20.76 .45	80.7 2.6	32.24 .06	28.1 0.7
20.1	9.91 −.02	1.4 −0.6	41.24 −.37	30.3 −3.0	20.37 −.33	78.0 −2.9	32.19 −.04	27.4 −0.6
Mar. 1.1	9.91 +.01	0.9 0.4	40.96 .20	27.2 3.1	20.10 .20	75.0 3.0	32.17 −.01	26.9 0.4
11.0	9.94 .05	0.6 −0.2	40.84 −.02	24.1 3.1	19.98 −.05	71.9 3.1	32.18 +.03	26.5 −0.2
21.0	10.01 .08	0.5 0.0	40.92 +.16	21.0 3.0	20.00 +.09	68.8 3.0	32.23 .06	26.4 0.0
31.0	10.11 .12	0.7 +0.3	41.17 .34	18.0 2.8	20.17 .24	65.9 2.8	32.31 .10	26.5 +0.2
Apr. 9.9	10.25 +.16	1.1 +0.6	41.60 +.50	15.3 −2.5	20.47 +.38	63.2 −2.5	32.43 +.14	26.9 +0.5
19.9	10.43 .20	1.9 0.9	42.18 .65	12.9 2.1	20.92 .50	60.8 2.1	32.60 .18	27.6 0.8
29.9	10.65 .23	2.9 1.2	42.90 .78	11.1 1.6	21.48 .61	58.9 1.7	32.80 .22	28.5 1.1
May 9.9	10.89 .26	4.2 1.4	43.74 .88	9.7 1.1	22.14 .70	57.5 1.2	33.03 .25	29.7 1.3
19.8	11.16 28	5.7 1.6	44.66 .95	8.9 −0.5	22.88 .77	56.6 −0.6	33.29 .27	31.2 1.6
29.8	11.46 +.30	7.4 +1.8	45.63 +.99	8.7 +0.1	23.67 +.81	56.3 0.0	33.58 +.29	32.9 +1.8
June 8.8	11.76 .31	9.3 1.9	46.63 1.00	9.1 0 6	24.50 .83	56.5 +0.5	33.88 .30	34.7 1.9
18.8	12.08 .31	11.3 2.0	47.63 .98	10.0 1.2	25.33 .82	57.3 1.1	34.19 .31	36.7 2.0
28.7	12.38 .30	13.3 2.0	48.59 .93	11.5 1.7	26.14 .79	58.7 1.6	34.50 .31	38.7 2.0
July 8.7	12.68 .29	15.3 2.0	49.49 .86	13.5 2.2	26.91 .74	60.6 2.1	34.80 .29	40.8 2.0
18.7	12.96 +.26	17.3 +1.9	50.32 +.77	15.9 +2.6	27.63 +.68	62.9 +2.5	35.09 +.27	42.8 +2.0
28.6	13.21 .24	19.2 1.8	51.04 .67	18.8 3.0	28.27 .60	65.6 2.8	35.35 .25	44.7 1.8
Aug. 7.6	13.43 .20	20.9 1.6	51.65 .55	21.9 3.3	28.82 .50	68.7 3.1	35.58 .22	46.5 1.7
17.6	13.61 .16	22.4 1.4	52.13 .41	25.3 3.5	29.27 .40	72 0 3.4	35.78 .18	48.1 1.5
27.6	13.75 .12	23.8 1.2	52.48 .27	29.0 3.7	29.62 .29	75.5 3.6	35.95 .14	49.5 1.3
Sept. 6.5	13.86 +.08	24.9 +1.0	52.68 +.13	32.7 +3.7	29.85 +.17	79.2 +3.7	36.07 +.10	50.7 +1.1
16.5	13.92 .05	25.7 0.8	52.73 −.02	36.5 3.7	29.96 +.06	82.9 3.7	36.15 .07	51.7 0.8
26.5	13.95 +.01	26.4 0.5	52.65 .16	40.2 3.6	29.96 −.06	86 8 3.6	36.20 +.03	52.4 0.6
Oct. 6.4	13.95 −.02	26.8 0.3	52.42 .29	43.7 3.5	29.85 .17	90.2 3.5	36.21 .00	52.9 0.4
16.4	13.91 .05	27.0 +0.1	52.05 .42	47.1 3.3	29.62 28	93.6 3.3	36.20 −.03	53.2 +0.2
26.4	13.85 −.07	27.0 −0.1	51.56 −.55	50.3 +2.9	29.29 −.38	96.7 +3.0	36.15 −.06	53.2 0.0
Nov. 5.4	13.77 .09	26.8 0.3	50.96 .66	53.0 2.5	28.86 .47	99.5 2.6	36.08 .08	53.1 −0.2
15.3	13.67 .10	26.5 0.4	50.25 .75	55.3 2.1	28.35 .55	101.9 2.1	36.00 .09	52.9 0.3
25.3	13.57 .11	26.0 0.5	49.45 .83	57.2 1 6	27.76 .62	103.8 1.6	35.90 .10	52.5 0.5
Dec. 5.3	13.45 .11	25.4 0.6	48.59 .88	58.5 1.0	27.12 .67	105.2 1.1	35.79 .11	51.9 0.6
15.3	13.34 −.11	24.7 −0.7	47.69 −.91	59.1 +0.4	26.43 −.70	106.0 +0.5	35.68 −.11	51.3 −0.7
25.2	13.23 .11	23.9 0.8	46.78 .91	59.2 −0.3	25.72 .71	106.2 −0.1	35.37 .11	50.5 0.8
35.2	13.12 −.10	23.1 −0.9	45.87 −.88	58.6 −0.9	25.01 −.70	105.8 −0.7	35.45 −.11	49.7 −0.8

APPARENT RIGHT ASCENSIONS AND APPROXIMATE NORTH POLAR DISTANCES, FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	β Cassiop.	22 Androm.	σ Androm.	ι Ceti.	6 Urs. Min., S. P.	44 Piscium.	π Androm.	o Cassiop.
	31° 28′	44° 33′	53° 50′	99° 27′	358° 19′	88° 41′	56° 54′	42° 20′
	h m 0 3	h m 0 4	h m 0 12	h m 0 13	h m 0 13	h m 0 19	h m 0 30	h m 0 38
	s	s	s	s	s	s	s	s
Jan. 0.2	11.80 − .34	29.46 − .23	27.99 − .18	42.12 − .09	69.46 +7.73	38.78 − .14	53.40 − .20	28.77 − .24
10.2	11.47 .32	29.24 .21	27.82 .16	42.02 .10	77.19 7.61	38.65 .12	53.21 .17	28.53 .24
20.2	11.16 .30	29.04 .19	27.66 .15	41.91 .10	84.67 7.22	38.55 .10	53.06 .16	28.29 .23
30.2	10.88 − .27	28.85 − .18	27.51 − .14	41.82 − .09	91.64 +6.66	38.46 − .08	52.90 − .17	28.07 − .22
. .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Aug. 26.6	16.02 + .24	33.08 + .17	31.37 + .18	45.30 + .16	33.98 −3.00	41.87 + .16	56.54 + .18	32.13 + .25
Sept. 5.5	16.22 .16	33.23 .13	31.53 .14	45.45 .13	31.48 2.00	42.02 .13	56.71 .16	32.35 .19
15.5	16.34 .09	33.34 .08	31.65 .09	45.57 .09	29.97 −0.98	42.14 .10	56.86 .12	32.51 .14
25.5	16.39 + .03	33.40 + .04	31.71 .05	45.65 .05	29.52 +0.09	42.21 .06	56.95 .07	32.63 .09
Oct. 5.5	16.40 − .02	33.42 .00	31.74 + .01	45.68 + .02	30.16 1.19	42.25 + .03	57.00 + .03	32.69 .05
15.4	16.35 − .08	33.39 − .05	31.74 − .02	45.67 − .01	31.90 +2.29	42.27 .00	57.02 .00	32.72 + .01
25.4	16.23 .14	33.32 .09	31.70 .06	45.65 .03	34.75 3.39	42.25 − .03	57.00 − .03	32.70 − .04
Nov. 4.4	16.06 .19	33.22 .12	31.63 .09	45.61 .06	38.68 4.43	42.21 .06	56.97 .06	32.63 .08
14.4	15.86 .23	33.08 .15	31.53 .12	45.53 .09	43.61 5.39	42.14 .08	56.88 .09	32.53 .12
24.3	15.61 .26	32.91 .17	31.40 .14	45.43 .10	49.45 6.22	42.05 .09	56.78 .11	32.40 .15
Dec. 4.3	15.34 − .29	32.73 − .19	31.26 − .15	45.33 − .10	56.06 +6.91	41.96 − .10	56.67 − .12	32.23 − .18
14.3	15.02 .32	32.53 .20	31.10 .16	45.23 .11	63.28 7.42	41.85 .11	56.53 .14	32.04 .20
24.2	14.70 .32	32.32 .21	30.93 .17	45.10 .12	70.90 7.71	41.75 .11	56.38 .16	31.83 .21
34.2	14.38 − .31	32.11 − .20	30.77 − .16	44.99 − .11	78.69 +7.77	41.64 − .10	56.21 − .18	31.61 − .22

Mean Solar Date.	δ Piscium.	γ Cassiop.	μ Androm.	43 Cephei.	κ Tucanæ.	f Piscium.	κ Octantis, S. P.	υ Androm.
	83° 1′	29° 53′	52° 6′	4° 21′	159° 28′	86° 59′	184° 47′	49° 9′
	h m 0 42	h m 0 49	h m 0 50	h m 0 53	h m 1 11	h m 1 12	h m 1 22	h m 1 30
	s	s	s	s	s	s	s	s
Jan. 0.3	51.57 − .11	57.12 − .34	31.83 − .18	38.97 −2.86	57.26 − .54	0.73 − .13	57.59 +2.75	13.40 − .18
10.2	51.46 .12	56.77 .35	31.65 .18	36.11 2.85	56.72 .54	0.60 .13	60.40 2.81	13.21 .20
20.2	51.33 .13	56.42 .34	31.47 .18	33.26 2.83	56.18 .53	0.47 .13	63.21 2.75	13.01 .22
30.2	51.21 − .12	56.09 − .32	31.29 − .18	30.46 −2.77	55.67 − .50	0.35 − .12	65.89 +2.56	12.78 − .24
. .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Sept. 5.6	54.62 + .16	61.13 + .26	35.10 + .18	54.19 +1.44	61.44 + .40	3.52 + .19	52.44 −1.61	16.36 + .25
15.5	54.76 .12	61.36 .20	35.26 .14	55.43 1.04	61.79 .30	3.69 .15	51.05 1.17	16.59 .20
25.5	54.86 .08	61.52 .13	35.38 .10	56.27 .62	62.05 .20	3.81 .11	50.11 .72	16.77 .15
Oct. 5.5	54.92 .05	61.62 .07	35.47 .06	56.68 + .21	62.19 + .10	3.92 .07	49.61 − .25	16.90 .11
15.5	54.96 + .02	61.66 + .01	35.51 + .02	56.69 − .23	62.24 − .01	3.97 .04	49.62 + .26	17.00 .07
25.4	54.97 .00	61.64 − .05	35.52 − .01	56.22 − .67	62.17 − .12	4.00 + .02	50.14 + .76	17.05 + .04
Nov. 4.4	54.95 − .03	61.55 .11	35.49 .05	55.34 1.10	61.99 .22	4.01 − .01	51.13 1.24	17.08 + .01
14.4	54.91 .06	61.42 .17	35.42 .08	54.02 1.50	61.72 .31	3.98 .03	52.62 1.69	17.06 − .03
24.3	54.84 .08	61.21 .22	35.33 .11	52.33 1.89	61.36 .39	3.94 .05	54.50 2.07	17.01 .07
Dec. 4.3	54.75 .09	60.98 .25	35.21 .13	50.25 2.24	60.93 .45	3.88 .07	56.77 2.40	16.91 .10
14.3	54.66 − .10	60.71 − .30	35.07 − .15	47.85 −2.52	60.47 − .49	3.79 − .09	59.30 +2.62	16.81 − .13
24.3	54.54 .11	60.38 .33	34.91 .16	45.20 2.72	59.95 .52	3.69 .10	62.01 2.76	16.66 .16
34.2	54.43 − .10	60.05 − .34	34.75 − .16	42.40 −2.84	59.42 − .52	3.59 − .10	64.81 +2.80	16.49 − .18

APPARENT RIGHT ASCENSIONS AND APPROXIMATE NORTH POLAR DISTANCES, FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	π Piscium.	ν Piscium.	ζ Ceti.	γ Androm.	β Trianguli.	4 Urs. Min., S. P.	γ Trianguli.	67 Ceti.
	78° 26′	85° 5′	100° 53′	48° 12′	55° 33′	348° 4′	56° 40′	96° 56′
	h m 1 31	h m 1 35	h m 1 45	h m 1 57	h m 2 2	h m 2 9	h m 2 10	h m 2 11
	s	s	s	s	s	s	s	s
Jan. 0.3	9.26 − .13	35.74 − .12	55.50 − .12	1.58 − .19	52.79 − .14	13.40 +1.05	39.40 − .12	23.53 − .10
10.3	9.13 .13	35.62 .12	55.38 .12	1.39 .19	52.64 .16	14.48 1.10	39.26 .16	23.42 .12
20.2	9.00 .13	35.50 .13	55.26 .13	1.20 .20	52.47 .18	15.61 1.14	39.09 .18	23.30 .14
30.2	8.86 .14	35.36 .13	55.11 .14	0.98 .21	52.28 .19	16.77 1.15	38.90 .19	23.15 .15
Feb. 9.2	8.73 .13	35.24 .12	54.97 .13	0.76 .20	52.09 .18	17.90 1.11	38.72 .18	23.00 .14
19.2	8.60 − .13	35.12 − .12	54.84 − .12	0.57 − .19	51.92 − .16	18.98 +1.05	38.54 − .17	22.86 − .13
. .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Sept. 25.6	12.25 + .14	38.68 + .13	58.29 + .15	4.79 + .19	55.83 + .17	11.24 − .55	42.34 + .18	26.13 + .18
Oct. 5.5	12.37 .10	38.80 .10	58.43 .12	4.97 .15	55.99 .15	10.77 .39	42.51 .16	26.29 .14
15.5	12.45 .07	38.89 .07	58.52 .08	5.10 .11	56.13 .12	10.46 .23	42.66 .13	26.40 .11
25.5	12.50 + .04	38.94 + .04	58.59 + .05	5.20 + .07	56.23 + .08	10.31 − .06	42.78 + .10	26.50 + .08
Nov. 4.5	12.52 + .01	38.98 + .02	58.63 + .02	5.25 + .03	56.29 .04	10.34 + .13	42.85 .06	26.56 .04
14.5	12.53 − .01	38.98 − .01	58.63 − .01	5.27 .00	56.32 + .01	10.56 .31	42.90 + .03	26.58 + .01
24.4	12.50 .03	38.96 .04	58.61 .03	5.26 − .04	56.32 − .02	10.97 .49	42.90 − .01	26.59 − .01
Dec. 4.4	12.44 .06	38.90 .06	58.57 .06	5.19 .08	56.28 .05	11.54 .66	42.88 .05	26.56 .04
14.3	12.37 − .08	38.83 − .08	58.49 − .08	5.10 − .11	56.21 − .08	12.29 + .82	42.81 − .08	26.51 − .07
24.3	12.27 .10	38.73 .10	58.40 .10	4.97 .14	56.11 .12	13.18 .96	42.71 .11	26.42 .09
34.3	12.17 − .10	38.63 − .10	58.29 − .11	4.82 − .17	55.97 − .16	14.21 +1.10	42.58 − .14	26.33 − .09

Mean Solar Date.	δ Hydri.	δ Ceti.	μ Hydri.	θ Persei.	σ Arietis.	47 Cephei.	ε Arietis.	β Persei. (*Algol.*)
	159° 10′	90° 9′	169° 36′	41° 15′	75° 23′	11° 2′	69° 6′	49° 29′
	h m 2 19	h m 2 33	h m 2 33	h m 2 36	h m 2 45	h m 2 51	h m 2 52	h m 3 0
	s	s	s	s	s	s	s	s
Jan. 0.3	45.94 − .53	44.40 − .09	65.50 −1.12	33.53 − .18	18.56 − .10	17.04 − .76	48.56 − .09	53.26 − .10
10.3	45.40 .55	44.30 .11	64.35 1.18	33.34 .21	18.45 .12	16.22 .88	48.46 .11	53.14 .14
20.3	44.84 .56	44.18 .13	63.14 1.22	33.12 .23	18.32 .13	15.28 .99	48.34 .13	52.97 .19
30.3	44.27 .57	44.04 .14	61.91 1.22	32.87 .25	18.19 .15	14.25 1.05	48.19 .15	52.76 .21
Feb. 9.2	43.71 .56	43.89 .15	60.70 1.19	32.62 .26	18.03 .16	13.19 1.08	48.03 .16	52.55 .22
19.2	43.15 − .55	43.73 − .16	59.52 −1.16	32.36 − .26	17.87 − .15	12.10 −1.09	47.86 − .17	52.33 − .21
. .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Sept. 25.6	48.46 + .36	46.85 + .19	67.54 + .70	36.62 + .28	21.03 + .21	22.69 + .89	51.04 + .20	55.96 + .26
Oct. 5.6	48.77 .26	47.02 .16	68.16 .53	36.88 .24	21.22 .17	23.51 .75	51.23 .18	56.21 .23
15.6	48.99 .16	47.16 .13	68.59 .32	37.10 .19	21.37 .14	24.19 .61	51.40 .17	56.43 .20
25.5	49.10 + .06	47.28 + .11	68.80 + .09	37.26 + .14	21.51 + .12	24.72 + .46	51.57 + .14	56.61 + .16
Nov. 4.5	49.11 − .05	47.38 .07	68.77 − .14	37.39 .10	21.62 .09	25.11 .27	51.69 .10	56.76 .12
14.5	49.00 .16	47.42 .03	68.52 .36	37.46 .05	21.69 .06	25.29 + .08	51.77 .06	56.86 08
24.4	48.78 .26	47.45 + .01	68.05 .56	37.50 + .01	21.74 + .03	25.28 − .09	51.82 + .03	56.93 + .04
Dec. 4.4	48.48 .35	47.44 − .02	67.40 .74	37.48 − .04	21.74 .00	25.08 .31	51.84 .00	56.95 .00
14.4	48.09 − .42	47.40 − .05	66.57 − .91	37.41 − .09	21.73 − .03	24.68 − .49	51.83 − .03	56.93 − .04
24.4	47.64 .48	47.34 .67	65.59 1.03	37.29 .14	21.68 .07	24.10 .66	51.78 .06	56.86 .08
34.3	47.13 − .53	47.26 − .09	64.51 −1.12	37.13 − .19	21.59 − .11	23.37 − .80	51.70 − .10	56.76 − .11

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Mean Solar Date.	ρ Octantis. S. P.	ι Hydri.	f Tauri.	γ Camelop.	γ Hydri.	ε Persei.	A¹ Tauri.	σ Persei.
	185° 55′	167° 48′	77° 27′	19° 1′	164° 35′	50° 19′	68° 14′	42° 35′
	h m 3 17	h m 3 18	h m 3 24	h m 3 38	h m 3 48	h m 3 50	h m 3 58	h m 4 0
	s	s	s	s	s	s	s	s
Jan. 0.4	25.92 +2.11	49.08 − .87	41.51 − .06	34.78 − .32	62.02 − .61	20.78 − .08	4.79 − .02	32.60 − .08
10.3	28.11 2.26	48.17 .95	41.43 .09	34.41 .42	61.37 .69	20.68 .12	4.74 .07	32.50 .12
20.3	30.44 2.39	47.18 1.02	41.32 .12	33.95 .49	60.64 .77	20.55 .15	4.63 .12	32.35 .17
30.3	32.86 2.44	46.12 1.06	41.18 .14	33.43 .56	59.82 .83	20.37 .19	4.50 .15	32.15 .21
Feb. 9.3	35.32 2.44	45.05 1.07	41.03 .16	32.83 .60	58.97 .87	20.17 .21	4.34 .17	31.92 .24
19.2	37.77 +2.39	43.98 −1.06	40.86 − .17	32.22 − .62	58.08 − .88	19.95 − .22	4.17 − .19	31.67 − .27
29.2	40.10 +2.26	42.93 −1.02	40.69 − .17	31.60 − .61	57.20 − .86	19.72 − .22	3.97 − .20	31.39 − .29
. .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .
Oct. 5.6	32.14 −1.10	49.37 + .65	43.87 + .24	38.76 + .60	61.38 + .60	23.35 + .28	7.03 + .25	35.25 + .32
15.6	31.19 .77	49.93 .46	44.08 .18	39.32 .52	61.92 .48	23.62 .25	7.27 .23	35.56 .30
25.5	30.60 − .38	50.30 + .27	44.23 + .15	39.80 + .44	62.33 + .35	23.86 + .23	7.49 + .20	35.85 + .27
Nov. 4.5	30.44 + .06	50.48 + .08	44.37 .13	40.19 .34	62.61 .20	24.08 .19	7.67 .17	36.09 .23
14.5	30.72 .48	50.47 − .10	44.50 .10	40.48 .24	62.73 + .05	24.24 .15	7.83 .14	36.30 .18
24.5	31.40 .88	50.28 .28	44.57 .06	40.66 .12	62.71 − .08	24.38 .11	7.95 .10	36.45 .13
Dec. 4.4	32.49 1.29	49.90 .46	44.62 + .03	40.72 + .01	62.56 .23	24.46 .06	8.04 .06	36.56 .08
14.4	33.97 +1.64	49.35 − .62	44.63 .00	40.68 − .10	62.25 − .39	24.51 + .02	8.08 + .03	36.61 + .02
24.4	35.76 1.94	48.65 .77	44.62 − .04	40.51 .23	61.78 .52	24.50 − .03	8.10 − .01	36.60 − .03
34.4	37.82 +2.18	47.81 − .91	44.55 − .09	40.22 − .35	61.21 − .62	24.44 − .09	8.07 − .05	36.55 − .08

Mean Solar Date.	o¹ Eridani.	η Urs. Min., S. P.	m Persei.	δ Mensæ.	τ Tauri.	i Tauri.	ζ Aurigæ.	β Eridani.
	97° 8′	346° 1′	47° 11′	170° 28′	67° 16′	71° 21′	49° 5′	95° 14′
	h m 4 6	h m 4 20	h m 4 25	h m 4 25	h m 4 35	h m 4 44	h m 4 54	h m 5 2
	s	s	s	s	s	s	s	s
Jan. 0.4	24.21 − .03	42.17 + .47	32.79 − .04	41.30 − .90	31.80 .00	49.76 .00	39.64 + .03	21.12 .00
10.4	24.16 .08	42.72 .63	32.73 .08	40.32 1.06	31.77 − .05	49.74 − .04	39.63 − .04	21.10 − .04
20.4	24.05 .11	43.43 .77	32.62 .14	39.17 1.22	31.69 .10	49.69 .08	39.55 .11	21.04 .08
30.3	23.94 .14	44.26 .85	32.45 .18	37.88 1.34	31.57 .13	49.58 .13	39.42 .16	20.94 .11
Feb. 9.3	23.78 .16	45.14 .92	32.26 .21	36.50 1.42	31.43 .16	49.44 .15	39.24 .20	20.82 .14
19.3	23.63 − .17	46.10 + .96	32.03 − .24	35.05 −1.46	31.26 − .18	49.28 − .17	39.03 − .22	20.66 − .17
29.2	23.44 .19	47.07 .95	31.79 .24	33.58 1.46	31.06 .19	49.09 .19	38.80 .23	20.49 .19
Mar. 10.2	23.23 − .20	48.01 + .92	31.55 − .23	32.13 −1.42	30.88 − .16	48.90 − .18	38.56 − .24	20.29 − .20
. .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .
Oct. 15.6	26.26 + .21	41.81 − .73	35.47 + .30	37.65 + .89	34.06 + .28	51.90 + .26	42.07 + .33	22.79 + .22
25.6	26.46 + .18	41.15 − .59	35.76 + .27	38.44 + .69	34.32 + .24	52.15 + .24	42.39 + .30	23.02 + .23
Nov. 4.6	26.63 .15	40.63 .45	36.02 .24	39 03 .47	34.54 .21	52.38 .22	42.68 .27	23.25 .21
14.5	26.77 .13	40.26 .29	36.24 .20	39.38 + .23	34.74 .18	52.59 .18	42.94 .24	23.43 .18
24.5	26.89 .10	40.05 − .13	36.42 .16	39.49 − .02	34.89 .14	52.74 .15	43.16 .19	23.60 .15
Dec. 4.5	26.96 .05	40.01 + .05	36.56 .11	39.33 .28	35.03 .10	52.88 .12	43.32 .15	23.74 .11
14.5	26.99 + .02	40.15 + .22	36.64 + .05	38.94 − .52	35.10 + .06	52.98 + .08	43.46 + .10	23.83 + .07
24.4	27.00 − .01	40.46 .40	36.67 + .01	38.30 .76	35.15 + .02	53.03 + .03	43.52 + .04	23.88 + .03
34.4	26.97 − .04	40.95 + .56	36.66 − .03	37.43 − .98	35.15 − .02	53.04 − .01	43.54 .00	23.90 .00

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Mean Solar Date.	τ Orionis.	χ Aurigæ.	Groombr. 944.	κ Orionis.	ν Aurigæ.	δ Doradus.	β Aurigæ.	θ Aurigæ.
	96° 58′	57° 53′	4° 52′	99° 43′	50° 53′	155° 47′	45° 4′	52° 48′
	h m 5 12	h m 5 25	h m 5 26	h m 5 42	h m 5 43	h m 5 44	h m 5 51	h m 5 52
	s	s	s	s	s	s	s	s
Jan. 0.4	10.61 + .01	26.94 + .06	22.33 − .30	27.26 + .05	44.29 + .07	37.67 − .15	19.60 + .08	5.73 + .08
10.4	10.60 − .02	26.97 .00	21.80 .76	27.29 .00	44.33 + .01	37.48 .23	19.65 + .01	5.78 + .02
20.4	10.56 .07	26.94 − .06	20.80 1.23	27.25 − .05	44.31 − .05	37.20 .32	19.63 − .06	5.77 − .04
30.4	10.46 .11	26.85 .11	19.34 1.61	27.18 .09	44.22 .10	36.83 .40	19.54 .11	5.69 .09
Feb. 9.3	10.33 .14	26.72 .15	17.48 2.00	27.06 .13	44.10 .15	36.40 .47	19.41 .16	5.59 .13
19.3	10.18 − .16	26.54 − .18	15.34 −2.30	26.91 − .16	43.92 − .19	35.90 − .52	19.21 − .20	5.43 − .18
29.3	10.01 .18	26.36 .20	12.99 2.41	26.74 .18	43.71 .22	35.37 .55	19.00 .23	5.22 .21
Mar. 10.3	9.81 .20	26.15 .21	10.53 2.46	26.55 .19	43.48 .23	34.79 .58	18.75 .26	5.00 .22
20.2	9.62 − .18	25.93 − .21	8.06 −2.46	26.36 − .18	43.26 − .21	34.22 − .56	18.48 − .28	4.78 − .21
. .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Oct. 25.6	12.43 + .24	29.34 + .29	31.06 +2.56	28.86 + .26	46.68 + .34	36.54 + .45	22.05 + .39	8.04 + .32
Nov. 4.6	12.66 .22	29.62 .27	33.45 2.22	29.11 .24	47.01 .32	36.96 .40	22.42 .35	8.36 .31
14.6	12.87 .19	29.88 .24	35.50 1.89	29.33 .21	47.32 .29	37.34 .33	22.75 .32	8.67 .29
24.5	13.03 .16	30.11 .22	37.22 1.51	29.54 .18	47.58 .25	37.61 .23	23.06 .28	8.93 .26
Dec. 4.5	13.18 .12	30.32 .18	38.51 1.05	29.69 .14	47.82 .20	37.80 .14	23.31 .23	9.18 .22
14.5	13.28 + .08	30.46 + .13	39.32 + .56	29.83 + .11	47.99 + .15	37.88 + .04	23.52 + .17	9.37 + .16
24.5	13.33 + .03	30.57 .08	39.62 + .05	29.91 .06	48.13 .10	37.87 − .07	23.66 .12	9.50 .11
34.4	13.36 − .01	30.62 + .02	39.42 − .45	29.95 + .02	48.20 + .05	37.74 − .18	23.76 + .08	9.59 + .06

Mean Solar Date.	η Geminor.	ψ¹ Aurigæ.	ν Geminor.	χ Draconis, S. P.	ε Geminor.	ψ⁵ Aurigæ.	θ Geminor.	ζ Mensæ.
	67° 28′	40° 39′	69° 43′	342° 41′	64° 46′	46° 19′	55° 54′	170° 42′
	h m 6 8	h m 6 16	h m 6 22	h m 6 22	h m 6 37	h m 6 38	h m 6 45	h m 6 49
	s	s	s	s	s	s	s	s
Jan. 0.5	7.59 + .08	17.23 + .13	19.30 + .09	60.37 + .04	3.00 + .13	40.64 + .16	25.03 + .15	31.57 − .19
10.5	7.65 + .03	17.32 + .05	19.37 + .04	60.47 .17	3.10 .06	40.76 .08	25.15 .09	31.27 .41
20.4	7.66 − .02	17.33 − .03	19.39 − .01	60.70 .31	3.13 + .01	40.79 + .01	25.20 + .02	30.74 .65
30.4	7.61 .07	17.26 .10	19.36 .05	61.09 .43	3.12 − .04	40.77 − .05	25.20 − .04	29.97 .88
Feb. 9.4	7.51 .11	17.14 .15	19.29 .10	61.57 .53	3.05 .09	40.69 .11	25.13 .09	28.98 1.08
19.4	7.40 − .14	16.97 − .20	19.17 − .14	62.15 + .64	2.94 − .13	40.55 − .17	25.02 − .14	27.81 −1.24
29.3	7.24 .17	16.74 .25	19.02 .16	62.84 .71	2.80 .16	40.35 .21	24.86 .18	26.51 1.37
Mar. 10.3	7.06 .19	16.47 .28	18.85 .18	63.58 .74	2.62 .18	40.13 .23	24.67 .20	25.08 1.46
20.3	6.86 .20	16.19 .29	18.65 .20	64.33 .76	2.43 .19	39.90 .25	24.46 .21	23.59 1.50
30.3	6.67 .19	15.90 .28	18.46 .18	65.10 .76	2.23 .20	39.64 .26	24.25 .22	22.07 1.52
Apr. 9.2	6.49 − .18	15.63 − .26	18.29 − .16	65.86 + .75	2.04 − .19	39.39 − .25	24.02 − .22	20.54 −1.52
. .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Nov. 14.6	10.13 + .28	20.40 + .36	21.72 + .29	60.61 − .57	5.47 + .29	43.50 + .37	27.65 + .34	24.72 + .97
24.6	10.39 .24	20.75 .33	21.99 .25	60.10 .45	5.75 .26	43.85 .33	27.97 .30	25.58 .75
Dec. 4.6	10.61 .20	21.07 .28	22.22 .21	59.71 .33	6.00 .24	44.16 .28	28.24 .26	26.22 .52
14.5	10.79 + .16	21.31 + .21	22.42 + .17	59.44 − .21	6.23 + .20	44.42 + .25	28.49 + .22	26.62 + .27
24.5	10.93 .12	21.50 .16	22.57 .13	59.30 − .06	6.39 .15	44.64 .19	28.69 .18	26.76 .00
34.5	11.03 + .08	21.64 + .12	22.68 + .09	59.33 + .11	6.53 + .11	44.79 + .12	28.84 + .13	26.63 − .26

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Mean Solar Date.	ζ Geminor.	63 Aurigæ.	25 Camelop.	γ^2 Volantis.	β Can. Min.	26 Lyncis.	Groombr. 1374.	ω^1 Cancri.
	69° 16′	50° 30′	7° 23′	160° 19′	81° 29′	42° 9′	15° 47′	64° 18′
	h m 6 57	h m 7 3	h m 7 7	h m 7 9	h m 7 21	h m 7 46	h m 7 46	h m 7 54
	s	s	s	s	s	s	s	s
Jan. 0.5	28.51 + .14	57.71 + .15	34.97 + .64	46.06 + .06	5.13 + .16	33.93 + .26	48.66 + .54	9.68 + .19
10.5	28.63 .09	57.84 .10	35.46 + .29	46.05 − .08	5.26 .10	34.15 .18	49.08 .31	9.85 .15
20.5	28.68 + .03	57.92 + .05	35.56 − .05	45.90 .21	5.33 + .05	34.28 .10	49.29 + .14	9.98 .10
30.4	28.69 − .02	57.93 − .01	35.35 .39	45.64 .32	5.36 .00	34.35 + .03	49.36 − .01	10.04 + .04
Feb. 9.4	28.65 .07	57.87 .07	34.77 .72	45.25 .42	5.33 − .05	34.35 − .04	49.27 .18	10.05 − .02
19.4	28.56 − .12	57.78 − .12	33.91 −1.00	44.79 − .51	5.25 − .09	34.27 − .11	48.99 − .34	10.01 − .06
29.4	28.42 .15	57.62 .18	32.77 1.23	44.23 .60	5.15 .12	34.13 .16	48.59 .46	9.92 .10
Mar. 10.3	28.27 .17	57.42 .21	31.44 1.41	43.60 .65	5.01 .15	33.94 .22	48.07 .56	9.80 .14
20.3	28.09 .19	57.21 .22	29 97 1.52	42.93 .68	4.85 .17	33.72 .24	47.46 .65	9.63 .16
30.3	27.89 .19	56.98 .23	28.41 1.56	42.24 .70	4.67 .18	33.47 .25	46.77 .70	9.46 .18
Apr. 9.2	27.71 − .18	56.75 − .22	26.82 −1.56	41.54 − .68	4.50 − .17	33.21 − .26	46.06 − .71	9.27 − .19
19.2	27.53 − .17	56.54 − .20	25.29 −1.52	40.87 − .65	4.33 − .16	32.95 − .25	45.35 − .68	9.09 − .18
. .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Nov. 24.6	31.10 + .27	60.69 + .33	43.24 +1.65	44.48 + .46	7.42 + .26	36.92 + .42	53.03 + .91	12.15 + .34
Dec. 4.6	31.36 .24	61.00 .29	44.78 1.42	44.89 .36	7.67 .25	37.32 .36	53.88 .81	12.47 .30
14.6	31.59 + .20	61.28 + .25	46.09 +1.16	45.20 + .25	7.91 + .22	37.67 + .33	54.65 + .71	12.74 + .27
24.5	31.77 .16	61.51 .20	47.09 .85	45.39 .13	8.11 .18	37.99 .29	55.29 .58	13.00 .24
34.5	31.92 + .13	61.69 + .14	47.78 + .54	45.45 + .02	8.26 + .14	38.25 + .25	55.80 + .45	13.22 + .20

Mean Solar Date.	ζ^1 Cancri.	β Cancri.	30 Monocerotis.	θ Chamæleontis.	σ Hydræ.	γ Cancri.	σ^2 Cancri. (*mean.*)	θ Hydræ.
	72° 1′	80° 28′	93° 32′	167° 7′	86° 16′	68° 8′	59° 0′	87° 13′
	h m 8 5	h m 8 10	h m 8 20	h m 8 23	h m 8 32	h m 8 36	h m 8 47	h m 9 8
	s	s	s	s	s	s	s	s
Jan. 0.6	47.69 + .17	26.87 + .17	4.32 + .17	66.05 + .30	54.69 + .18	48.55 + .23	24.88 + .25	32.54 + .24
10.6	47.85 .15	27.03 .15	4.48 .14	66.27 + .14	54.86 .16	48.76 .18	25.11 .21	32.76 .20
20.5	47.99 .11	27.15 .10	4.61 .10	66.34 − .03	55.02 .12	48.92 .13	25.30 .15	32.93 .15
30.5	48.06 + .05	27.23 + .05	4.67 + .05	66.20 .21	55.10 .07	49.03 .08	25.42 .10	33.05 .10
Feb. 9.5	48.09 .00	27.26 .00	4.70 .00	65.91 .38	55.15 + .02	49.08 + .03	25.49 + .04	33.13 + .05
19.4	48.06 − .05	27.23 − .05	4.68 − .05	65.44 − .56	55.14 − .03	49.08 − .02	25.51 − .01	33.16 .00
29.4	47.98 .10	27.16 .09	4.61 .09	64.79 .71	55.08 .08	49.04 .07	25.46 .07	33.14 − .04
Mar. 10.4	47.86 .13	27.05 .12	4.50 .12	64.03 .81	54.99 .11	48.94 .11	25.37 .11	33.07 .08
20.4	47.73 .15	26.91 .15	4.38 .14	63.18 .90	54.88 .13	48.82 .14	25.25 .14	32.98 .11
30.3	47.56 .17	26.76 .16	4.22 .16	62.24 .96	54.73 .15	48.67 .16	25.09 .17	32.86 .13
Apr. 9.3	47.38 − .17	26.60 − .17	4.05 − .17	61.26 −1.00	54.57 − .16	48.51 − .17	24.91 − .18	32.72 − .14
19.3	47.22 .16	26.43 .17	3.88 .16	60.24 1.02	54.41 .16	48.34 .17	24.73 .18	32.58 .15
29.2	47.06 .16	26.26 .15	3.72 .16	59.21 1.02	54.25 .15	48.17 .16	24.56 .17	32.43 .15
May 9.2	46.91 − .15	26.12 − .12	3.56 − .15	58.20 −1.00	54.11 − .13	48.02 − .14	24.40 − .15	32.28 − .14

APPARENT RIGHT ASCENSIONS AND APPROXIMATE NORTH POLAR DISTANCES, FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	β Argus.	α Lyncis.	10 Leonis Minoris.	o Leonis.	ζ Chamæleontis.	19 Leonis Minoris.	π Leonis.	λ Ursæ Majoris.
	159° 15′	55° 8′	53° 4′	79° 36′	170° 26′	48° 25′	81° 25′	46° 32′
	h m 9 11	h m 9 14	h m 9 27	h m 9 35	h m 9 37	h m 9 50	h m 9 54	h m 10 10
	s	s	s	s	s	s	s	s
Jan. 0.6	61.76 + .39	13.94 + .27	21.75 + .30	10.49 + .25	17.82 + .83	49.36 + .36	17.73 + .26	20.23 + .38
10.6	62.09 .26	14.20 .24	22.03 .26	10.73 .22	18.54 .61	49.69 .30	17.98 .24	20.59 .34
20.6	62.29 .15	14.43 .20	22.28 .22	10.94 .18	19.04 .38	49.97 .25	18.21 .20	20.91 .28
30.5	62.39 + .04	14.59 .14	22.46 .15	11.09 .13	19.29 + .13	50.19 .18	18.39 .15	21.14 .21
Feb. 9.5	62.37 − .08	14.70 .07	22.58 .09	11.21 .08	19.31 − .10	50.34 .12	18.51 .10	21.34 .15
19.5	62.22 − .20	14.73 + .01	22.64 + .03	11.25 + .03	19.09 − .32	50.43 + .06	18.57 + .05	21.45 + .08
29.5	61.98 .30	14.73 − .04	22.64 − .02	11.27 − .01	18.67 .53	50.46 .00	18.61 + .01	21.50 + .02
Mar. 10.4	61.63 .39	14.65 .09	22.60 .08	11.23 .06	18.03 .72	50.44 − .05	18.59 − .04	21.50 − .03
20.4	61.21 .45	14.55 .12	22.48 .12	11.15 .09	17.22 .89	50.35 .11	18.53 .07	21.44 .09
30.4	60.73 .52	14.40 .15	22.35 .15	11.05 .11	16.26 1.03	50.22 .14	18.44 .10	21.33 .13
Apr. 9.3	60.18 − .55	14.24 − .17	22.19 − .17	10.92 − .13	15.16 −1.15	50.07 − .17	18.33 − .12	21.17 − .16
19.3	59.62 .57	14.05 .19	22.00 .19	10.79 .14	13.97 1.23	49.88 .19	18.20 .13	20.99 .19
29.3	59.04 .58	13.86 .18	21.81 .18	10.64 .15	12.71 1.28	49.68 .20	18.07 .14	20.79 .20
May 9.3	58.45 .59	13.69 .17	21.64 .17	10.50 .14	11.42 1.31	49.49 .19	17.93 .13	20.59 .19
19.2	57.87 − .58	13.53 − .15	21.47 − .16	10.37 − .13	10.09 −1.34	49.30 − .18	17.80 − .12	20.40 − .18

Mean Solar Date.	μ Hydræ.	β Leonis Minoris.	α Antliæ.	β Octantis, S. P.	41 Leonis Minoris.	δ² Chamæleontis.	46 Leonis Minoris.	Groombr. 1706.
	106° 16′	52° 43′	120° 30′	188° 2′	66° 14′	169° 57′	55° 11′	11° 38′
	h m 10 20	h m 10 21	h m 10 22	h m 10 34	h m 10 37	h m 10 44	h m 10 47	h m 10 50
	s	s	s	s	s	s	s	s
Jan. 20.7	41.23 + .18	24.76 + .28	2.55 + .21	22.24 − .68	19.87 + .26	51.34 + .76	3.12 + .28	60.29 + .93
30.6	41.40 .15	25.01 .21	2.74 .16	21.70 .41	20.10 .20	51.99 .54	3.38 .23	61.14 .77
Feb. 9.6	41.54 .11	25.19 .15	2.88 .12	21.42 − .16	20.27 .15	52.43 .33	3.59 .18	61.83 .58
19.5	41.63 .06	25.31 .10	2.97 .07	21.38 + .08	20.41 .11	52.65 + .12	3.73 .12	62.30 .36
29.5	41.65 + .01	25.38 + .04	3.01 + .01	21.58 .31	20.48 + .05	52.68 − .08	3.84 + .06	62.56 + .16
Mar. 10.5	41.65 − .03	25.38 − .01	2.99 − .04	21.99 + .54	20.51 .00	52.49 − .29	3.86 + .01	62.62 − .05
20.4	41.60 .08	25.35 .06	2.94 .08	22.66 .78	20.49 − .04	52.11 .47	3.86 − .04	62.46 .26
30.4	41.50 .10	25.25 .11	2.84 .11	23.54 .99	20.43 .07	51.55 .65	3.79 .08	62.10 .45
Apr. 9.4	41.39 .11	25.13 .14	2.72 .13	24.63 1.17	20.34 .09	50.83 .79	3.70 .11	61.57 .59
19.4	41.27 .12	24.98 .16	2.59 .15	25.88 1.33	20.24 .11	49.98 .91	3.58 .13	60.92 .72
29.3	41.15 − .13	24.82 − .17	2.43 − .16	27.28 +1.46	20.11 − .13	49.02 −1.01	3.44 − .15	60.14 − .82
May 9.3	41.01 .14	24.65 .18	2.27 .16	28.79 1.57	19.97 .14	47.96 1.08	3.29 .16	59.29 .88
19.3	40.87 .13	24.46 .17	2.11 .17	30.41 1.66	19.83 .14	46.86 1.13	3.13 .16	58.39 .90
29.3	40.74 .13	24.31 .15	1.94 .15	32.10 1.69	19.70 .13	45.70 1.18	2.97 .15	57.48 .89
June 8.2	40.61 − .12	24.16 − .13	1.80 − .13	33.79 +1.66	19.58 − .11	44.51 −1.18	2.83 − .13	56.60 − .86

APPARENT RIGHT ASCENSIONS AND APPROXIMATE NORTH POLAR DISTANCES, FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	η Octantis.	p^3 Leonis.	ψ Urs. Maj.	ν Urs. Maj.	ξ Hydræ.	χ Urs. Maj.	π Virginis.	ε Corvi.
	173° 59′	87° 26′	44° 54′	56° 18′	121° 14′	41° 36′	82° 46′	112° 0′
	h m 11 0	h m 11 1	h m 11 3	h m 11 12	h m 11 27	h m 11 40	h m 11 55	h m 12 4
	s	s	s	s	s	s	s	s
Feb. 9.6	19.97 + .65	12.17 + .14	22.68 + .21	26.52 + .20	30.71 + .17	8.82 + .28	8.54 + .23	22.65 + .22
19.6	20.45 + .31	12.30 .11	22.87 .16	26.70 .15	30.87 .14	9.07 .22	8.74 .17	22.85 .17
29.5	20.59 − .02	12.40 .07	23.01 .10	26.83 .10	31.00 .10	9.25 .15	8.88 .12	23.00 .13
Mar. 10.5	20.41 .35	12.44 + .02	23.07 + .03	26.89 + .04	31.06 + .04	9.37 .08	8.99 .08	23.11 .09
20.5	19.89 .66	12.45 − .01	23.07 − .02	26.91 .00	31.08 .00	9.41 + .02	9.04 .04	23.17 .05
30.5	19.10 − .94	12.41 − .04	23.02 − .07	26.88 − .05	31.07 − .03	9.41 − .04	9.08 + .01	23.19 + .02
Apr. 9.4	18.01 1.21	12.37 .06	22.92 .11	26.81 .08	31.02 .07	9.34 .09	9.07 − .02	23.21 .00
19.4	16.69 1.44	12.28 .09	22.80 .14	26.72 .10	30.93 .09	9.24 .12	9.04 .05	23.18 − .04
29.4	15.14 1.64	12.18 .10	22.63 .17	26.60 .13	30.83 .11	9.09 .16	8.97 .07	23.13 .07
May 9.3	13.42 1.79	12.08 .11	22.45 .18	26.46 .15	30.71 .13	8.92 .18	8.89 .08	23.04 .10
19.3	11.57 −1.90	11.96 − .12	22.26 − .20	26.31 − .14	30.57 − .14	8.73 − .20	8.80 − .09	22.94 − .11
29.3	9.63 1.98	11.85 .11	22.05 .20	26.17 .15	30.43 .15	8.53 .21	8.71 .10	22.84 .11
June 8.3	7.62 2.00	11.73 .10	21.86 .18	26.01 .15	30.27 .15	8.31 .21	8.59 .11	22.72 .12
18.2	5.64 −1.96	11.63 − .09	21.65 − .17	25.87 − .14	30.13 − .14	8.11 − .19	8.49 − .10	22.61 − .11

Mean Solar Date.	2 Can. Ven.	6 Urs. Min.	d^2 Corvi.	β Can. Ven.	γ Virginis, (*mean.*)	31 Cor. Bor.	γ Cassiop., S. P.	43 Cephei, S. P.
	48° 43′	1° 41′	105° 53′	48° 2′	90° 50′	61° 51′	330° 7′	355° 39′
	h m 12 10	h m 12 14	h m 12 24	h m 12 28	h m 12 35	h m 12 46	h m 12 49	h m 12 53
	s	s	s	s	s	s	s	s
Feb. 9.6	31.29 + .27	38.08 +5.69	4.89 + .23	25.83 + .29	59.56 + .26	14.97 + .26	55.77 − .31	28.19 −2.49
19.6	31.54 .23	43.22 4.54	5.10 .19	26.10 .25	59.79 .20	15.22 .23	55.49 .25	25.90 2.11
29.6	31.75 .17	47.16 3.29	5.27 .15	26.33 .20	59.96 .15	15.44 .19	55.27 .19	23.99 1.68
Mar. 10.5	31.89 .11	49.80 1.94	5.40 .11	26.49 .14	60.09 .11	15.60 .14	55.12 .11	22.54 1.20
20.5	31.97 .06	51.03 + .52	5.50 .07	26.60 .08	60.19 .08	15.73 .10	55.04 − .04	21.58 .69
30.5	32.01 + .02	50.85 − .86	5.54 + .04	26.66 + .03	60.26 + .05	15.80 + .05	55.03 + .04	21.15 − .09
Apr. 9.5	32.01 − .03	49.31 2.17	5.57 + .01	26.67 − .01	60.29 + .02	15.84 + .02	55.12 .13	21.40 + .49
19.4	31.95 .07	46.51 3.37	5.56 − .02	26 64 .05	60.29 − .01	15.84 − .01	55.29 .21	22.12 .99
29.4	31.87 .10	42.57 4.43	5.53 .04	26.56 .10	60.27 .03	15.81 .05	55.53 .29	23.38 1.48
May 9.4	31.75 .13	37.65 5.33	5.48 .07	26 45 .12	60.23 .05	15.74 .07	55.86 .36	25.07 1.89
19.4	31.61 − .15	31.92 −6.01	5.40 − .09	26.32 − .14	60.16 − .07	15.67 − .09	56.25 + .41	27.15 +2.24
29.3	31.46 .16	25.63 6.53	5.30 .10	26.17 .16	60.08 .08	15.56 .10	56.68 .45	29.55 2.52
June 8.3	31.29 .17	18.86 6.81	5.20 .10	26.00 .17	60.00 .10	15.45 .11	57.15 .50	32.18 2.71
18.3	31.12 − .16	12.02 −7.01	5.10 − .09	25.82 − .18	59.89 − .10	15.33 − .11	57.68 + .56	34.97 +2.84

APPARENT RIGHT ASCENSIONS AND APPROXIMATE NORTH POLAR DISTANCES, FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	δ Muscæ.	ε Virginis.	20 Can. Ven.	κ Octantis.	B.A.C. 4536.	m Virginis.	θ Apodis.	π Hydræ.
	160° 57′	78° 26′	48° 50′	175° 13′	52° 15′	98° 8′	166° 15′	116° 9′
	h m 12 54	h m 12 56	h m 13 12	h m 13 23	h m 13 29	h m 13 35	h m 13 54	h m 14 0
	s	s	s	s	s	s	s	s
Feb. 29.6	38.71 + .41	36.85 + .16	31.97 + .24	12.64 +1.75	48.38 + .28	44.71 + .21	30.72 + .78	0.36 + .22
Mar. 10.6	39.07 .31	37.00 .14	32.19 .20	14.24 1.43	48.62 .20	44.90 .17	31.44 .66	0.58 .21
20.6	39.33 .21	37.14 .11	32.36 .14	15.49 1.05	48.79 .15	45.05 .14	32.04 .54	0.79 .18
30.5	39.50 .12	37.22 .07	32.47 .09	16.34 .66	48.92 .11	45.18 .12	32.51 .41	0.94 .14
Apr. 9.5	39.56 + .02	37.27 .04	32.54 .05	16.82 + .29	49.00 .07	45 29 .08	32.86 .28	1.08 .12
19.5	39.54 − .07	37.30 + .01	32.56 + .01	16.92 − .10	49.05 + .02	45.34 + .04	33.07 + .14	1.18 + .08
29.5	39.42 .16	37.28 − .02	32.55 − .04	16.61 .49	49.06 − .01	45.38 + .02	33.15 + .01	1.25 .05
May 9.4	39.22 .24	37.26 .05	32.48 .08	15.94 .87	49.03 .05	45.39 .00	33.09 − .12	1.28 + .02
19.4	38.93 .32	37.19 .07	32.38 .11	14.88 1.20	48.96 .09	45.38 − .02	32.92 .24	1.29 .00
29.4	38.59 .38	37.12 .08	32.27 .13	13.54 1.50	48.86 .11	45.34 .05	32.61 .36	1.28 − .03
June 8.4	38.17 − .45	37.03 − .09	32.13 − .15	11.87 −1.80	48.74 − .13	45.28 − .07	32.20 − .48	1.24 − .06
18.3	37.70 .50	36 94 .10	31.97 .17	9.94 2.04	48.61 .14	45.21 .08	31.66 .58	1.15 .09
28.3	37.18 .51	36.82 .11	31.79 .18	7.80 2.23	48.46 .16	45.12 .10	31.05 .66	1.06 .11
July 8.3	36.68 − .48	36.71 − .10	31.61 − .17	5.48 −2.40	48.28 − .18	45.01 − .12	30.35 − .74	0.94 − .13

Mean Solar Date.	d Bootis.	κ Virginis.	δ Octantis.	4 Urs. Min.	λ Bootis.	λ Virginis.	α Apodis.	μ Hydri, S. P.
	64° 23′	99° 45′	173° 9′	11° 56′	43° 24′	102° 51′	168° 34′	190° 24′
	h m 14 5	h m 14 6	h m 14 9	h m 14 9	h m 14 12	h m 14 13	h m 14 34	h m 14 33
	s	s	s	s	s	s	s	s
Mar. 20.6	18.41 + .18	56.26 + .18	14.22 +1.14	21.54 + .62	8.66 + .21	3.96 + .17	5.21 + .82	56.56 − .78
30.6	18.57 .13	56.42 .14	15.24 .90	22.06 .42	8.85 .17	4.12 .15	5.96 .68	55.85 .64
Apr. 9.5	18.68 .10	56.55 .11	16.02 .63	22.38 .22	9.00 .12	4.26 .13	6.57 .53	55.29 .47
19.5	18.77 .07	56.64 .08	16.51 .36	22.51 + .04	9.10 .07	4.38 .10	7.03 .37	54.92 .27
29.5	18.82 + .04	56.71 .05	16.74 + .09	22.47 − .14	9.14 + .02	4.45 .06	7.32 .21	54.76 − .07
May 9.5	18.85 .00	56.74 + .03	16.69 − .19	22.23 − .32	9.14 − .02	4.50 + .03	7.45 + .05	54.78 + .13
19.4	18.83 − .04	56.77 + .01	16.37 .45	21.84 .47	9.09 .07	4.51 .00	7.43 − .11	55.01 .32
29.4	18.78 .06	56.76 − .02	15.80 .71	21.30 .61	9.01 .10	4.51 − .02	7.23 .28	55.42 .51
June 8.4	18.70 .08	56.73 .04	14.95 .96	20.63 .73	8.89 .14	4.47 .05	6.88 .43	56.02 .69
18.3	18.62 .09	56.67 .07	13.89 1.17	19.85 .82	8.74 .17	4.41 .07	6.37 .57	56.79 .84
28.3	18.52 − .11	56.59 − .09	12.62 −1.35	19.00 − .89	8.55 − .19	4.33 − .09	5.75 − .69	57.69 + .97
July 8.3	18.39 .13	56.49 .11	11.20 1.49	18.07 .95	8.35 .21	4.23 .11	4.99 .81	58.72 1.09
18.3	18.26 .14	56.38 .12	9.64 1.63	17.11 .97	8.13 .22	4.11 .12	4.14 .89	59.87 1.17
28.2	18.11 − .15	56.25 − .13	7.95 −1.76	16.13 − .98	7.90 − .23	3.99 − .11	3.21 − .95	61.06 +1.23

APPARENT RIGHT ASCENSIONS AND APPROXIMATE NORTH POLAR DISTANCES, FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	33 Bootis.	47 Cephei, S. P.	γ Scorpii.	δ Bootis.	ρ Octantis.	β Cor. Bor.	γ Camelop., S. P.	δ^1 Apodis.
	45° 7′	348° 58′	114° 50′	56° 16′	174° 5′	60° 30′	340° 59′	168° 25′
	h m 14 34	h m 14 51	h m 14 57	h m 15 10	h m 15 17	h m 15 23	h m 15 38	h m 16 3
	s	s	s	s	s	s	s	s
Mar. 30.6	41.38 + .19	8.71 − .54	32.13 + .22	60.27 + .22	46.22 +1.68	13.61 + .23	30.13 − .42	42.73 +1.08
Apr. 9.6	41.55 .14	8.28 .33	32.33 .18	60.47 .17	47.76 1.40	13.82 .18	29.78 .28	43.74 .94
19.5	41.67 .09	8.06 − .11	32.48 .14	60.62 .13	49.02 1.10	13.98 .15	29.56 .16	44.61 .80
29.5	41.74 .05	8.05 + .10	32.62 .11	60.73 .10	49.96 .79	14.12 .12	29.46 − .03	45.35 .66
May 9.5	41.78 + .01	8.26 .33	32.72 .08	60.82 .06	50.59 .47	14.22 .07	29.49 + .10	45.93 .51
19.5	41.77 − .04	8.71 + .54	32.78 + .05	60.86 + .02	50.91 + .14	14.27 + .04	29.65 + .23	46.37 + .34
29.4	41.70 .08	9.33 .71	32.82 + .02	60.87 − .01	50.87 − .21	14.30 + .01	29.94 .35	46.61 + .15
June 8.4	41.61 .11	10.13 .86	32.82 − .01	60.85 .05	50.50 .53	14.29 − .03	30.34 .46	46.68 − .01
18.4	41.49 .14	11.08 1.01	32.79 .04	60.77 .08	49.81 .84	14.25 .06	30.86 .55	46.59 .19
28.4	41.33 .17	12.15 1.13	32.75 .07	60.68 .11	48.82 1.15	14.16 .09	31.44 .63	46.30 .37
July 8.3	41.14 − .20	13.31 +1.20	32.65 − .10	60.56 − .13	47.52 −1.41	14.06 − .12	32.12 + .71	45.85 − .51
18.3	40.93 .21	14.54 1.25	32.54 .12	60.41 .16	46.01 1.64	13.93 .15	32.86 .76	45.28 .65
28.3	40.71 .23	15.80 1.27	32.41 .14	60.24 .18	44.25 1.82	13.77 .17	33.63 .79	44.55 .79
Aug. 7.2	40.47 .24	17.08 1.27	32.25 .16	60.05 .19	42.38 1.90	13.59 .18	34.42 .79	43.71 .88
17.2	40.23 .23	18.33 1.23	32.09 .17	59.85 .20	40.45 1.94	13.40 .19	35.21 .79	42.79 .94
27.2	40.00 − .22	19.55 +1.19	31.91 − .18	59.65 − .20	38.51 −1.92	13.21 − .19	36.00 + .79	41.83 − .96

Mean Solar Date.	ϕ Herculis.	σ Cor. Bor. (*mean.*)	γ Apodis.	η Urs. Min.	η Ophiuchi.	π Herculis.	θ Ophiuchi.	δ Aræ.
	44° 46′	55° 51′	168° 39′	13° 59′	105° 35′	53° 4′	114° 53′	150° 35′
	h m 16 5	h m 16 10	h m 16 16	h m 16 20	h m 17 3	h m 17 11	h m 17 15	h m 17 21
	s	s	s	s	s	s	s	s
Apr. 9.6	15.47 + .25	30.02 + .24	23.42 +1.00	50.44 + .63	58.01 + .27	9.60 + .30	8.60 + .31	0.87 + .55
19.6	15.70 .20	30.24 .20	24.36 .88	51.01 .51	58.27 .25	9.88 .26	8.89 .27	1.38 .48
29.6	15.88 .16	30.42 .15	25.17 .73	51.45 .37	58.51 .22	10.12 .22	9.14 .24	1.83 .43
May 9.6	16.03 .13	30.55 .12	25.81 .58	51.74 .21	58.72 .19	10.33 .18	9.37 .22	2.25 .38
19.5	16.14 .08	30.67 .09	26.32 .41	51.87 + .06	58.90 .16	10.49 .15	9.58 .19	2.60 .32
29.5	16.18 + .03	30.73 + .04	26.63 + .23	51.86 − .09	59.05 + .13	10.63 + .12	9.75 + .16	2.90 + .26
June 8.5	16.19 − .02	30.76 + .01	26.78 + .05	51.69 .25	59.17 .11	10.72 .08	9.90 .13	3.13 .19
18.4	16.14 .07	30.75 − .03	26.72 − .13	51.37 .39	59.27 .07	10.79 + .03	10.01 .08	3.29 .11
28.4	16.05 .11	30.70 .07	26.52 .30	50.91 .52	59.31 + .02	10.77 − .03	10.06 .04	3.36 + .04
July 8.4	15.92 .15	30.61 .10	26.11 .49	50.33 .64	59.31 − .01	10.73 .07	10.09 + .01	3.37 − .03
18.4	15.74 − .19	30.49 − .14	25.54 − .64	49.64 − .74	59.30 − .04	10.64 − .11	10.08 − .04	3.30 − .11
28.3	15.53 .22	30.33 .17	24.83 .77	48.86 .82	59.22 .08	10.51 .15	10.01 .08	3.15 .18
Aug. 7.3	15.30 .24	30.14 .19	24.01 .88	48.01 .88	59.13 .11	10.33 .18	9.91 .11	2.94 .25
17.3	15.05 .27	29.94 .21	23.07 .96	47.10 .93	59.00 .14	10.14 .21	9.78 .14	2.66 .31
27.3	14.77 .28	29.72 .22	22.10 .99	46.16 .95	58.85 .16	9.91 .23	9.62 .17	2.33 .35
Sept. 6.2	14.50 − .27	29.49 − .22	21.09 −1.00	45.21 − .94	58.67 − .18	9.67 − .24	9.43 − .19	1.97 − .37
16.2	14.23 .26	29.27 .22	20.11 .95	44.27 .90	58.49 .17	9.43 .25	9.24 .19	1.59 .37
26.2	13.97 .24	29.05 .23	19.19 .87	43.41 .84	58.32 .16	9.17 .24	9.05 .17	1.22 .35
Oct. 6.1	13.75 − .20	28.81 − .23	18.37 − .76	42.60 − .78	58.17 − .14	8.94 − .22	8.89 − .15	0.88 − .33

APPARENT RIGHT ASCENSIONS AND APPROXIMATE NORTH POLAR DISTANCES, FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	Groombr. 944, S.P.	ι Herculis.	θ Herculis.	ο Herculis.	λ Sagittarii.	χ Draconis.	ζ Pavonis.	γ Lyræ.
	355° 8′	43° 56′	52° 44′	61° 15′	115° 29′	17° 19′	161° 31′	57° 28′
	h m	h m	h m	h m	h m	h m	h m	h m
	17 25	17 36	17 52	18 3	18 21	18 23	18 29	18 54
	s	s	s	s	s	s	s	s
May 19.6	58.22 − .48	20.18 + .18	26.36 + .21	12.01 + .19	5.02 + .25	8.28 + .42	60.43 + .65	46.66 + .26
29.6	57.97 − .03	20.34 .14	26.54 .15	12.18 .15	5.25 .22	8.64 .30	61.03 .55	46.90 .22
June 8.5	58.18 + .44	20.46 .09	26.66 .11	12.31 .11	5.45 .19	8.88 .18	61.54 .45	47.10 .18
18.5	58.85 .89	20.51 + .04	26.76 .07	12.41 .07	5.63 .15	9.00 + .06	61.93 .34	47.26 .14
28.5	59.96 1.32	20.53 − .01	26.80 + .02	12.45 + .02	5.76 .11	8.99 − .08	62.22 .23	47.38 .09
July 8.4	61.48 +1.70	20.49 − .07	26.80 − .03	12.45 − .03	5.86 + .06	8.84 − .21	62.38 + .10	47.44 + .05
18.4	63.36 2.04	20.39 .12	26.74 .07	12.39 .07	5.89 + .01	8.58 .32	62.42 − .02	47.48 + .01
28.4	65.55 2.34	20.25 .17	26.66 .11	12.31 .11	5.88 − .03	8.21 .43	62.34 .14	47.46 − .05
Aug. 7.4	68.04 2.60	20.05 .22	26.51 .16	12.16 .16	5.82 .07	7.73 .53	62.13 .27	47.38 .10
17.3	70.74 2.78	19.82 .25	26.33 .19	11.98 .19	5.74 .10	7.16 .62	61.81 .38	47.27 .14
27.3	73.59 +2.91	19.56 − .27	26.13 − .22	11.78 − .22	5.61 − .15	6.49 − .69	61.38 − .47	47.11 − .17
Sept. 6.3	76.56 3.00	19.27 .29	25.89 .24	11.54 .24	5.44 .17	5.78 .74	60.88 .54	46.92 .20
16.2	79.59 2.99	18.97 .30	25.64 .25	11.29 .25	5.26 .18	5.01 .79	60.30 .58	46.70 .22
26.2	82.61 2.97	18.66 .30	25.39 .26	11.04 .26	5.07 .19	4.21 .79	59.71 .60	46.48 .23
Oct. 6.2	85.58 2.90	18.38 .28	25.13 .25	10.78 .25	4.88 .18	3.42 .79	59.10 .61	46.24 .24
16.2	88.43 +2.78	18.11 − .27	24.89 − .23	10.54 − .24	4.70 − .17	2.63 − .78	58.50 − .60	46.01 − .23

Mean Solar Date.	ι Lyræ.	25 Camelop. S. P.	θ Lyræ.	β Cygni.	β Sagittæ.	δ Cygni.	Groombr. 1374, S.P.	ε Pavonis.
	54° 5′	352° 37′	52° 4′	62° 17′	72° 47′	45° 9′	344° 13′	163° 12′
	h m	h m	h m	h m	h m	h m	h m	h m
	19 3	19 7	19 12	19 26	19 36	19 41	19 46	19 47
	s	s	s	s	s	s	s	s
May 29.6	20.01 + .25	20.82 − .67	32.46 + .25	13.78 + .22	2.48 + .24	30.22 + .28	43.18 − .38	40.70 + .79
June 8.6	20.23 .19	20.30 .37	32.69 .20	14.00 .21	2.71 .22	30.48 .24	42.87 .24	41.43 .66
18.6	20.39 .14	20.08 − .07	32.87 .15	14.21 .18	2.92 .19	30.70 .19	42.69 − .12	42.07 .58
28.5	20.51 .10	20.16 + .22	33.00 .11	14.35 .13	3.08 .15	30.86 .14	42.63 + .01	42.60 .49
July 8.5	20.58 .05	20.51 .49	33.09 .05	14.46 .09	3.21 .10	30.98 .09	42.72 .14	43.01 .35
18.5	20.61 + .01	21.14 + .77	33.11 + .01	14.53 + .04	3.28 + .06	31.04 + .03	42.92 + .27	43.29 + .21
28.5	20.60 − .04	22.05 1.03	33.11 − .04	14.55 − .01	3.33 + .02	31.04 − .03	43.26 .40	43.43 + .07
Aug. 7.4	20.52 .09	23.19 1.25	33.03 .09	14.52 .06	3.33 − .03	30.98 .08	43.72 .48	43.43 − .08
17.4	20.41 .14	24.54 1.45	32.92 .13	14.44 .10	3.27 .07	30.88 .13	44.26 .58	43.27 .21
27.4	20.25 .18	26.08 1.64	32.76 .18	14.32 .14	3.18 .10	30.72 .18	44.92 .71	43.00 .33
Sept. 6.3	20.05 − .21	27.81 +1.80	32.56 − .21	14.17 − .17	3.07 − .13	30.52 − .22	45.68 + .79	42.61 − .45
16.3	19.84 .23	29.67 1.91	32.34 .23	13.98 .20	2.91 .17	30.28 .24	46.50 .86	42.10 .55
26.3	19.59 .25	31.62 1.99	32.10 .25	13.77 .21	2.73 .19	30.03 .27	47.40 .92	41.52 .61
Oct. 6.3	19.35 .25	33.64 2.04	31.84 .25	13.55 .22	2.54 .19	29.76 .28	48.35 .96	40.89 .65
16.2	19.10 .24	35.70 2.03	31.59 .25	13.34 .21	2.35 .19	29.46 .28	49.32 .97	40.23 .66
26.2	18.86 − .22	37.71 +2.00	31.34 − .23	13.13 − .20	2.16 − .17	29.16 − .28	50.30 + .99	39.57 − .64
Nov. 5.2	18.66 − .18	39.71 +1.98	31.12 − .20	12.93 − .19	2.01 − .13	28.89 − .26	51.30 +1.00	38.94 − .60

APPARENT RIGHT ASCENSIONS AND APPROXIMATE NORTH POLAR DISTANCES, FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	γ Sagittæ.	c Sagittarii.	θ Aquilæ.	31 Cygni.	α Delphini.	β Pavonis.	ψ Capricor.	ε Cygni.
	70° 49′	118° 1′	91° 9′	43° 36′	74° 29′	156° 36′	115° 40′	56° 27′
	h m	h m	h m	h m	h m	h m	h m	h m
	19 53	19 55	20 5	20 10	20 34	20 34	20 39	20 41
	s	s	s	s	s	s	s	s
June 18.6	48.37 + .20	48.05 + .26	33.21 + .20	8.48 + .22	27.78 + .22	54.54 + .54	29.37 + .25	42.58 + .24
28.6	48.55 .16	48.28 .20	33.40 .17	8.68 .18	27.99 .20	55.04 .45	29.61 .23	42.81 .21
July 8.6	48.69 .11	48.45 .16	33.56 .14	8.84 .13	28.18 .16	55.45 .37	29.84 .21	43.01 .16
18.5	48.79 .07	48.60 .12	33.69 .10	8.94 .06	28.31 .11	55.78 .28	30.03 .16	43.14 .11
28.5	48.84 + .03	48.69 .07	33.77 .05	8.98 + .01	28.41 .07	56.01 .17	30.15 .10	43.24 .06
Aug. 7.5	48.85 − .01	48.73 + .01	33.80 + .01	8.96 − .04	28.45 + .03	56.13 + .06	30.22 + .05	43.27 + .01
17.4	48.82 .06	48.71 − .04	33.79 − .03	8.87 .11	28.47 − .01	56.14 − .04	30.26 + .01	43.26 − .03
27.4	48.73 .10	48.65 .08	33.75 .06	8.75 .16	28.43 .06	56.06 .14	30.24 − .04	43.21 .07
Sept. 6.4	48.62 .13	48.56 .12	33.66 .10	8.56 .20	28.35 .10	55.87 .24	30.18 .08	43.11 .12
16.4	48.48 .16	48.42 .15	33.54 .13	8.35 .24	28.24 .13	55.58 .32	30.09 .12	42.97 .16
26.3	48.30 − .18	48.25 − .17	33.40 − .15	8.09 − .28	28.10 − .15	55 24 − .38	29.95 − .15	42.79 − .18
Oct. 6.3	48.11 .19	48.08 .18	33.25 .16	7.80 .29	27.94 .17	54.82 .43	29.80 .17	42.60 .20
16.3	47.93 .19	47.88 .19	33.08 .17	7.51 .28	27.76 .18	54.38 .45	29.61 .18	42.39 .21
26.2	47.73 .18	47.70 .17	32.92 .16	7.23 .28	27.58 .17	53.92 .46	29.44 .17	42.18 .21
Nov. 5.2	47.57 .16	47.54 .15	32.76 .15	6.95 .27	27.43 .16	53.46 .42	29.27 .16	41.97 .20
15.2	47.41 − .14	47.39 − .13	32.62 − .12	6.68 − .25	27.27 − .15	53.03 − .40	29.12 − .15	41.76 − .19
25.2	47.30 − .11	47.27 − .10	32.52 − .08	6.44 − .22	27.13 − .13	52.65 − .36	28.98 − .13	41.58 − .17

Mean Solar Date.	τ Cygni.	ζ Capricor.	74 Cygni.	λ¹ Octantis.	ζ Chamæleontis, S.P.	π² Cygni.	16 Pegasi.	π Pegasi.
	52° 26′	112° 54′	50° 5′	173° 14′	189° 34′	41° 13′	64° 36′	57° 22′
	h m	h m	h m	h m	h m	h m	h m	h m
	21 10	21 20	21 32	21 33	21 37	21 42	21 47	22 5
	s	s	s	s	s	s	s	s
July 8.6	21.46 + .19	18.18 + .24	29.82 + .22	47.77 +1.43	4.38 − .80	41.78 + .27	59.88 + .24	2.78 + .25
18.6	21.63 .15	18.40 .19	30.02 .17	49.05 1.14	3.64 .67	42.02 .20	60.10 .17	3.01 .20
28.5	21.76 .10	18.56 .14	30.17 .13	50.04 .84	3.05 .47	42.18 .14	60.25 .13	3.19 .16
Aug. 7.5	21.83 + .05	18.69 .10	30.28 .07	50.73 .52	2.71 .25	42.30 .08	60.37 .10	3.33 .11
17.5	21.85 .00	18.75 + .05	30.32 + .02	51 08 + .18	2.55 − .05	42.34 + .02	60.44 .06	3.42 .07
27.5	21.83 − .06	18.78 + .01	30.32 − .03	51.10 − .15	2.62 + .20	42.34 − .03	60.48 + .01	3.47 + .02
Sept. 6.4	21.74 .10	18.77 − .04	30.25 .08	50.78 .50	2.96 .44	42.28 .08	60.46 − .04	3.46 − .03
16.4	21.63 .14	18.70 .08	30.15 .12	50.11 .81	3.49 .64	42.17 .14	60.39 .08	3.41 .07
26.4	21.47 .18	18.60 .11	30.01 .16	49.16 1.09	4.23 .84	41.99 .19	60.31 .11	3.33 .10
Oct. 6.4	21.27 .20	18.48 .13	29.82 .19	47.94 1.33	5.18 1.04	41.78 .22	60.18 .13	3.21 .14
16.3	21.07 − .21	18.34 − .15	29.62 − .20	46.51 −1.51	6.31 +1.19	41.55 − .24	60.04 − .15	3.06 − .16
26.3	20.85 .22	18.18 .17	29.41 .21	44.93 1.64	7.56 1.28	41.30 .26	59.88 .16	2.89 .18
Nov. 5.3	20.64 .22	18.01 .16	29.19 .22	43.24 1.63	8.87 1.33	41.03 .27	59.71 .17	2.71 .18
15.2	20.42 .21	17.86 .14	28.97 .21	41.56 1.66	10.22 1.35	40.75 .28	59.54 .16	2.52 .19
25.2	20.22 .19	17.72 .13	28.76 .20	39.91 1.59	11.57 1.30	40.48 .26	59.38 .15	2.33 .17
Dec. 5.2	20.03 − .18	17.60 − .10	28.56 − .19	38.38 −1.47	12.83 +1.20	40.23 − .23	59.24 − .13	2.18 − .13

APPARENT RIGHT ASCENSIONS AND APPROXIMATE NORTH POLAR DISTANCES, FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	υ Octantis.	γ Aquarii.	σ Aquarii.	α Lacertæ.	10 Lacertæ.	β Octantis.	λ Pegasi.	Groombr. 1706, S.P.
	176° 32′	91° 57′	101° 15′	40° 18′	51° 32′	171° 58′	67° 1′	348° 22′
	h m 22 9	h m 22 15	h m 22 24	h m 22 26	h m 22 34	h m 22 34	h m 22 41	h m 22 50
	s	s	s	s	s	s	s	s
July 8.6	71.92 +2.97	53.90 + .27	44.68 + .27	42.94 + .30	16.12 + .26	38.63 +1.40	9.87 + .28	54.29 − .64
18.6	74.69 2.53	54.14 .22	44.93 .23	43.22 .26	16.37 .23	39.96 1.26	10.13 .24	53.72 .50
28.6	76.99 2.03	54.33 .17	45.14 .19	43.46 .20	16.59 .20	41.15 1.06	10.35 .19	53.29 .37
Aug. 7.5	78.74 1.45	54.48 .13	45.31 .14	43.63 .14	16.77 .15	42.08 .81	10.51 .15	52.98 .24
17.5	79.90 .83	54.60 .09	45.43 .10	43.75 .08	16.90 .10	42.77 .55	10.65 .11	52.81 − .10
27.5	80.41 + .18	54.67 + .05	45.51 + .06	43.80 + .03	16.97 + .04	43.17 + .27	10.74 + .06	52.78 + .05
Sept. 6.5	80.26 − .49	54.69 + .01	45.55 + .02	43.81 − .03	16.99 .00	43.31 − .02	10.78 + .02	52.90 .21
16.4	79.43 1.12	54.69 − .03	45.56 − .01	43.75 .08	16.97 − .04	43.13 .32	10.79 − .02	53.21 .38
26.4	78.03 1.71	54.64 .07	45.53 .06	43.65 .12	16.90 .08	42.68 .58	10.75 .06	53.65 .52
Oct. 6.4	76.02 2.28	54.56 .09	45.46 .08	43.51 .17	16.80 .12	41.97 .82	10.67 .09	54.25 .66
16.4	73.48 −2.70	54.46 − .11	45.36 − .10	43.31 − .20	16.66 − .14	41.05 −1.03	10.57 − .11	54.97 + .82
26.3	70.59 3.05	54.35 .12	45.24 .12	43.11 .22	16.51 .16	39.91 1.21	10.46 .12	55.88 .95
Nov. 5.3	67.39 3.28	54.21 .13	45.11 .13	42.87 .24	16.33 .19	38.63 1.33	10.32 .13	56.87 1.05
15.3	64.03 3.39	54.08 .13	44.98 .13	42.62 .25	16.13 .19	37.25 1.40	10.19 .15	57.98 1.16
25.2	60.65 3.33	53.95 .12	44.85 .12	42.36 .26	15.95 .19	35.83 1.41	10.03 .15	59.19 1.23
Dec. 5.2	57.36 −3.17	53.83 − .11	44.73 − .11	42.10 − .25	15.75 − .19	34.43 −1.37	9.89 − .14	60.43 +1.25
15.2	54.32 −2.90	53.73 − .09	44.62 − .10	41.85 − .24	15.56 − .18	33.09 −1.29	9.76 − .13	61.70 +1.26

Mean Solar Date.	o Androm.	ϕ Aquarii.	τ Pegasi.	λ Androm.	i^1 Aquarii.	δ Sculptoris.	γ^1 Octantis.	33 Piscium.
	48° 17′	96° 39′	66° 52′	44° 9′	108° 54′	118° 45′	172° 38′	96° 20′
	h m 22 56	h m 23 8	h m 23 15	h m 23 32	h m 23 38	h m 23 43	h m 23 45	h m 23 59
	s	s	s	s	s	s	s	s
July 28.6	48.55 + .24	33.22 + .24	7.67 + .23	7.48 + .27	25.29 + .26	7.23 + .26	34.95 +1.46	37.81 + .25
Aug. 7.6	48.76 .18	33.43 .18	7.88 .18	7.73 .23	25.53 .22	7.48 .23	36.31 1.26	38.05 .22
17.6	48.91 .13	33.58 .14	8.04 .14	7.94 .18	25.73 .18	7.70 .19	37.47 1.03	38.26 .18
27.6	49.02 .08	33.71 .10	8.16 .10	8.09 .13	25.89 .13	7.86 .15	38.37 .76	38.42 .14
Sept. 6.5	49.07 + .03	33.79 .06	8.24 .06	8.20 .08	26.00 .09	8.00 .11	39.00 .46	38.55 .11
16.5	49.07 − .01	33.83 + .02	8.28 + .02	8.25 + .03	26.08 + .06	8.08 + .06	39.30 + .16	38.65 + .07
26.5	49.04 .06	33.83 − .01	8.29 − .02	8.26 − .01	26.12 + .01	8.12 + .02	39.33 − .15	38.70 + .03
Oct. 6.4	48.95 .10	33.81 .04	8.25 .05	8.23 .06	26.11 − .03	8.12 − .02	39.00 .46	38.72 .00
16.4	48.83 .13	33.74 .07	8.18 .08	8.14 .09	26.07 .05	8.08 .06	38.41 .74	38.70 − .03
26.4	48.70 .16	33.66 .09	8.09 .10	8.04 .12	26.01 .07	8.00 .09	37.52 1.01	38.67 .06
Nov. 5.4	48.52 − .18	33.56 − .10	7.98 − .12	7.89 − .16	25.92 − .10	7.90 − .11	36.39 −1.23	38.59 − .08
15.3	48.33 .19	33.44 .11	7.85 .13	7.71 .19	25.82 .12	7.79 .12	35.06 1.39	38.51 .09
25.3	48.13 .20	33.33 .12	7.73 .14	7.51 .20	25.69 .13	7.66 .13	33.61 1.50	38.42 .10
Dec. 5.3	47.92 .20	33.21 .12	7.58 .14	7.30 .21	25.57 .12	7.52 .14	32.06 1.57	38.31 .11
15.3	47.72 .19	33.09 .11	7.45 .14	7.09 .22	25.45 .12	7.38 .14	30.48 1.56	38.20 .11
25.2	47.53 − .19	32.99 − .09	7.31 − .13	6.87 − .22	25.33 − .11	7.24 − .14	28.93 −1.49	38.09 − .11
35.2	47.34 − .18	32.91 − .07	7.19 − .11	6.66 − .21	25.23 − .09	7.11 − .13	27.46 −1.38	37.98 − .11

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
Jan. 0	1 42 30.60	31.21	−23 5 31.5	31.0	11.048	+11.22	+ 3 17.15	16 18.44	1 11.13	18 39 13.52
1	18 46 55.61	56.30	23 0 48.3	47.6	11.036	12.37	3 45.62	16 18.44	1 11.09	18 43 10.08
2	18 51 20.31	21.09	22 55 37.6	36.7	11.022	13.52	4 13.77	16 18.43	1 11.05	18 47 6.63
3	18 55 44 68	45.54	22 49 59.4	58.3	11.008	14.66	4 41.58	16 18.42	1 11.00	18 51 3.19
4	19 0 8.68	9.63	22 43 54.0	52.7	10.992	15.79	5 9.02	16 18.40	1 10.94	18 54 59.75
5	19 4 32.28	33.31	−22 37 21.7	20.1	10.975	+16.91	+ 5 36.07	16 18.38	1 10.88	18 58 56.31
6	19 8 55.46	56.57	22 30 22.4	20.7	10.957	18.02	6 2.70	16 18.35	1 10.82	19 2 52.86
7	19 13 18.19	19.38	22 22 56.5	54.5	10.938	19.13	6 28.89	16 18.31	1 10.76	19 6 49.42
8	19 17 40.45	41.72	22 15 4.1	1.8	10.917	20.22	6 54.59	16 18.27	1 10.69	19 10 45.97
9	19 22 2.20	3.54	22 6 45.5	42.9	10.895	21.31	7 19.79	16 18.23	1 10.62	19 14 42.53
10	19 26 23.42	24.83	−21 57 61.0	58.1	10.873	+22.38	+ 7 44.46	16 18.19	1 10.54	19 18 39.08
11	19 30 44.08	45.55	21 48 50.7	47.5	10.849	23.44	8 8.57	16 18.14	1 10.46	19 22 35.64
12	19 35 4.15	5.69	21 39 15.0	11.5	10.823	24.50	8 32.09	16 18.09	1 10.38	19 26 32.20
13	19 39 23.62	25.22	21 29 14.1	10.3	10.797	25.55	8 55.00	16 18.03	1 10.29	19 30 28.76
14	19 43 42.44	44.10	21 18 48.3	44.2	10.770	26.58	9 17.27	16 17.97	1 10.20	19 34 25.31
15	19 48 0.60	2.32	−21 7 57.9	53.5	10.743	+27.60	+ 9 38.87	16 17.90	1 10.11	19 38 21.87
16	19 52 18.07	19.85	20 56 43.2	38.5	10.714	28.61	9 59.78	16 17.83	1 10.02	19 42 18.43
17	19 56 34.83	36.68	20 44 64.6	59.5	10.684	29 60	10 19.99	16 17.75	1 9.92	19 46 14.99
18	20 0 50.88	52.78	20 32 62.4	56.9	10.653	30.57	10 39.48	16 17.67	1 9.82	19 50 11.54
19	20 5 6.18	8.13	20 20 36.9	31.1	10.622	31.53	10 58.22	16 17.59	1 9.72	19 54 8.10
20	20 9 20.71	22.71	−20 7 48.5	42.4	10.590	+32.48	+11 16.20	16 17.51	1 9.62	19 58 4.65
21	20 13 34.47	36.51	19 54 37.5	31.0	10.557	33.41	11 33.40	16 17.42	1 9.51	20 2 1.21
22	20 17 47.44	49.52	19 40 64.3	57.4	10.524	34.33	11 49.81	16 17.32	1 9.41	20 5 57.76
23	20 21 59.61	61.73	19 27 9.3	2.0	10.491	35.24	12 5.42	16 17.22	1 9.30	20 9 54.32
24	20 26 10.98	13.14	19 12 52.7	45.2	10.458	36.13	12 20.23	16 17.12	1 9.19	20 13 50.88
25	20 30 21.55	23.74	−18 58 15.0	7.2	10.424	+37.00	+12 34.23	16 17.00	1 9.08	20 17 47.44
26	20 34 31.31	33.52	18 43 16.5	8.4	10.390	37.86	12 47.42	16 16.88	1 8.97	20 21 43.99
27	20 38 40.24	42.48	18 27 57.7	49.3	10.356	38.70	12 59.80	16 16.76	1 8.86	20 25 40.55
28	20 42 48.36	50.63	18 12 18.8	10.1	10.322	39.52	13 11.36	16 16.63	1 8.75	20 29 37.10
29	20 46 55.67	57.96	17 56 20.4	11.4	10.288	40.33	13 22 10	16 16.50	1 8.63	20 33 33.66
30	20 51 2.16	4.47	−17 39 62.8	53.5	10.254	+41.13	+13 32.03	16 16.36	1 8.52	20 37 30.21
31	20 55 7.84	10.17	17 23 26.3	16.7	10.220	41.90	13 41.15	16 16.21	1 8.40	20 41 26.77
Feb. 1	20 59 12 72	15.07	17 6 31.3	21.5	10.186	42.66	13 49.47	16 16.06	1 8.29	20 45 23.32
2	21 3 16.79	19.15	16 49 18.2	8.2	10.153	43.41	13 56.98	16 15.91	1 8.17	20 49 19.88
3	21 7 20.05	22.42	16 31 47.6	37.3	10.119	44.13	14 3.69	16 15.75	1 8.05	20 53 16.43
4	21 11 22.52	24.90	−16 13 59.6	49.1	10.086	+44.85	+14 9.60	16 15.58	1 7.93	20 57 12.99
5	21 15 24.19	26.58	15 55 54.8	44.0	10.053	45.54	14 14.70	16 15.41	1 7.81	21 1 9.54
6	21 19 25.07	27.46	15 37 33.6	22.6	10.020	46.22	14 19.01	16 15.24	1 7.69	21 5 6.10
7	21 23 25.16	27.55	15 18 56.3	45.1	9.987	46.88	14 22.53	16 15.06	1 7.58	21 9 2.65
8	21 27 24.46	26.85	14 59 63.3	51.9	9.955	47.52	14 25.27	16 14.88	1 7.47	21 12 59.21
9	21 31 22.98	25.37	−14 40 55.2	43.6	9.922	+48.15	+14 27.23	16 14.70	1 7.36	21 16 55.76
10	21 35 20.72	23.11	14 21 32.4	20.6	9.890	48.76	14 28.42	16 14.51	1 7.25	21 20 52.32
11	21 39 17.69	20.08	14 1 55.2	43.3	9.858	49.34	14 28.84	16 14.32	1 7.14	21 24 48.87
12	21 43 13.90	16.28	13 41 64.0	52.0	9.826	49.91	14 28.48	16 14.13	1 7.03	21 28 45.42
13	21 47 9.35	11.72	13 21 59.4	47.3	9.794	50.47	14 27.36	16 13.94	1 6.92	21 32 41.97
14	21 51 4.03	6.39	−13 1 41.8	29.5	9.763	+51.00	+14 25.48	16 13.74	1 6.81	21 36 38.53
15	21 54 57.96	60.31	−12 40 71.4	59.1	9.732	+51.52	+14 22 86	16 13.54	1 6.70	21 40 35.08

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0s.19 from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
Feb. 15	21 54 57.96	60.31	−12 40 71.4	59.1	9.732	+51.52	+14 22.86	16 13.54	1 6.70	21 40 35.08
16	21 58 51.15	53.48	12 20 28.9	16.5	9.701	52 01	14 19.49	16 13.34	1 6.60	21 44 31.64
17	22 2 43.61	45.92	11 59 34.7	22.2	9.671	52.49	14 15.38	16 13.14	1 6.50	21 48 28 19
18	22 6 35.35	37.64	11 38 29.1	16.6	9.641	52.96	14 10.56	16 12.94	1 6.40	21 52 24.75
19	22 10 26.38	28.65	11 17 12.6	0.1	9.612	53.40	14 5.03	16 12.73	1 6.30	21 56 21.30
20	22 14 16.72	18.96	−10 55 45.6	33.1	9.583	+53.83	+13 58.81	16 12.51	1 6.21	22 0 17.86
21	22 18 6.38	8.59	10 33 68.6	56.0	9.555	54.25	13 51.91	16 12.29	1 6.11	22 4 14.41
22	22 21 55.38	57.56	10 12 21.8	9.3	9.528	54.64	13 44.35	16 12.08	1 6.02	22 8 10.96
23	22 25 43.73	45.88	9 50 25.8	13.3	9.502	55.03	13 36.14	16 11.86	1 5.93	22 12 7.51
24	22 29 31.45	33.57	9 28 20.8	8.4	9.477	55.38	13 27.31	16 11.63	1 5.81	22 16 4.06
25	22 33 18.57	20.66	− 9 5 67.5	55.1	9.452	+55.73	+13 17.87	16 11.40	1 5.75	22 20 0.61
26	22 37 5.10	7.15	8 43 46.1	33.8	9.427	56.06	13 7.85	16 11.17	1 5.67	22 23 57.17
27	22 40 51.08	53.09	8 21 16.9	4.7	9.404	56.36	12 57.27	16 10.93	1 5.59	22 27 53.72
28	22 44 36.50	38.49	7 58 40.4	28.2	9.383	56 66	12 46.15	16 10.69	1 5.51	22 31 50.27
29	22 48 21.40	23.36	7 35 56.9	44.9	9.362	56.95	12 34.50	16 10.45	1 5 44	22 35 46.82
Mar. 1	22 52 5.81	7.73	− 7 12 67.0	55.1	9.341	+57.21	+12 22.34	16 10.20	1 5.37	22 39 43.38
2	22 55 49.74	51.63	6 49 70.8	59.1	9.321	57.46	12 9.71	16 9.94	1 5.30	22 43 39.93
3	22 59 33.21	35.06	6 26 68.8	57.3	9.302	57.70	11 56.62	16 9.68	1 5.23	22 47 36.49
4	23 3 16.24	18 05	6 3 61.4	50.0	9.284	57.91	11 43.10	16 9.43	1 5.16	22 51 33.04
5	23 6 58.86	60.63	5 40 48.9	37.7	9.268	58.12	11 29.16	16 9.17	1 5.10	22 55 29.59
6	23 10 41.09	42.82	− 5 17 31.7	20.7	9.252	+58.31	+11 14.83	16 8.91	1 5.04	22 59 26.14
7	23 14 22.93	24.62	4 53 70.2	59.4	9.236	58.47	11 0.12	16 8 64	1 4.99	23 3 22.70
8	23 18 4.41	6.06	4 30 44.9	34.3	9.221	58.63	10 45.05	16 8.38	1 4.93	23 7 19.25
9	23 21 45.55	47.16	4 7 16.1	5.8	9.207	58.77	10 29.65	16 8.11	1 4.88	23 11 15.80
10	23 25 26.36	27.93	3 43 44.2	34.1	9.194	58.88	10 13.92	16 7.85	1 4.83	23 15 12.35
11	23 29 6.85	8.38	− 3 19 69.4	59.6	9.181	+58.99	+ 9 57.86	16 7.58	1 4.79	23 19 8.91
12	23 32 47.07	48.54	2 56 32.3	22.7	9.170	59.08	9 41.50	16 7.32	1 4.74	23 23 5.46
13	23 36 27.00	28.44	2 32 53.3	43.9	9.159	59.15	9 24.88	16 7.05	1 4.70	23 27 2.01
14	23 40 6.68	8.08	2 9 12.7	3.6	9.148	59.21	9 8.01	16 6.79	1 4.66	23 30 58.56
15	23 43 46.11	47.46	1 45 31.0	22.2	9.139	59.25	8 50.89	16 6.52	1 4.63	23 34 55.11
16	23 47 25.31	26.61	− 1 21 48.5	40.1	9.130	+59.28	+ 8 33.54	16 6.25	1 4.60	23 38 51.66
17	23 51 4.30	5.56	0 57 65.6	57.5	9.121	59.29	8 15.98	16 5.98	1 4.58	23 42 48.22
18	23 54 43.10	44.31	0 34 22.7	14.9	9.114	59.28	7 58.24	16 5.72	1 4.56	23 46 44.77
19	23 58 21.73	22 90	− 0 10 40.1	32.6	9.107	59.25	7 40.32	16 5.45	1 4.54	23 50 41.32
20	0 2 0.21	1.33	+ 0 13 1.7	8.9	9.101	59.22	7 22.24	16 5.18	1 4.52	23 54 37.87
21	0 5 38.55	39.62	+ 0 36 42.3	49.3	9.095	+59.17	+ 7 4.04	16 4.91	1 4.50	23 58 34.43
22	0 9 16.79	17.81	1 0 21.6	28.2	9.091	59.10	6 45.74	16 4.64	1 4.49	0 2 30.98
23	0 12 54.94	55.92	1 23 59.1	65.4	9.089	59.02	6 27.34	16 4.37	1 4.48	0 6 27.53
24	0 16 33 03	33.96	1 47 34.4	40.4	9.087	58.92	6 8.88	16 4.10	1 4.47	0 10 24.08
25	0 20 11.07	11.96	2 11 7.1	12.8	9.085	58.80	5 50.36	16 3.83	1 4.47	0 14 20.64
26	0 23 49.09	49.93	+ 2 34 37.0	42.4	9.085	+58.68	+ 5 31.83	16 3.56	1 4.47	0 18 17.19
27	0 27 27.12	27.92	2 58 3.7	8.8	9.085	58.54	5 13.31	16 3.28	1 4.47	0 22 13.74
28	0 31 5.18	5.93	3 21 26.9	31.7	9.087	58.39	4 54.83	16 3.00	1 4.47	0 26 10.29
29	0 34 43.30	44.00	3 44 46.2	50.7	9.090	58.22	4 36.40	16 2.72	1 4.48	0 30 6.84
30	0 38 21.49	22.14	4 8 1.4	5.5	9.093	58.04	4 18.04	16 2.44	1 4.49	0 34 3.39
31	0 41 59.77	60.38	+ 4 31 12.1	15.9	9.097	+57.85	+ 3 59.77	16 2.16	1 4.51	0 37 59.95
32	0 45 38.18	38.74	+ 4 54 17.9	21.5	9.103	+57.63	+ 3 41.63	16 1.88	1 4.52	0 41 56.50

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0ˢ.18 from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
Apr. 1	0 45 38.18	38.74	+ 4 54 17.9	21.5	9.103	+57.63	+3 41.63	16 1.88	1 4.52	0 41 56.50
2	0 49 16.74	17.25	5 17 18.7	21.9	9.109	57.41	3 23.64	16 1.59	1 4.54	0 45 53.05
3	0 52 55.46	55.93	5 40 13.9	16.8	9.117	57.18	3 5.81	16 1.30	1 4.56	0 49 49.60
4	0 56 34.35	34.78	6 3 3.2	5.8	9.125	56.92	2 48.15	16 1.02	1 4.59	0 53 46.16
5	1 0 13.44	13.82	6 25 46.4	48.8	9.134	56.66	2 30.69	16 0.74	1 4.62	0 57 42.71
6	1 3 52.75	53.09	+ 6 48 23.2	25.4	9.143	+56.39	+2 13.46	16 0.46	1 4.65	1 1 39.26
7	1 7 32.30	32.59	7 10 53.1	55.0	9.153	56.09	1 56.46	16 0.18	1 4.68	1 5 35.81
8	1 11 12.09	12.34	7 33 15.7	17.3	9.164	55.78	1 39.70	15 59.90	1 4.72	1 9 32.37
9	1 14 52.14	52.35	7 55 30.8	32.1	9.175	55.46	1 23.21	15 59.62	1 4.76	1 13 28.92
10	1 18 32.48	32.65	8 17 38.0	39.0	9.187	55.12	1 7.00	15 59.35	1 4.80	1 17 25.47
11	1 22 13.11	13.24	+ 8 39 36.9	37.7	9.199	+54.77	+0 51.08	15 59.08	1 4.84	1 21 22.02
12	1 25 54.03	54.12	9 1 27.2	27.8	9.212	54.40	0 35.45	15 58.81	1 4.89	1 25 18.58
13	1 29 35.27	35.32	9 23 8.4	8.7	9.225	54.02	0 20.13	15 58.54	1 4.93	1 29 15.13
14	1 33 16.83	16.84	9 44 40.3	40.4	9.239	53.62	+0 5.14	15 58.28	1 4.98	1 33 11.69
15	1 36 58.73	58.70	10 6 2.5	2.4	9.253	53.21	−0 9.51	15 58.02	1 5.03	1 37 8.24
16	1 40 40.98	40.91	+10 27 14.7	14.4	9.268	+52.79	−0 23.81	15 57.76	1 5.09	1 41 4.79
17	1 44 23.60	23.49	10 48 16.4	15.9	9.283	52.34	0 37.74	15 57.50	1 5.15	1 45 1.34
18	1 48 6.60	6.46	11 9 7.4	6.7	9.300	51.89	0 51.29	15 57.25	1 5.21	1 48 57.90
19	1 51 49.99	49.81	11 29 47.3	46.4	9.317	51.42	1 4.46	15 57.00	1 5.27	1 52 54.45
20	1 55 33.78	33.57	11 50 15.7	14.6	9.334	50.94	1 17.22	15 56.75	1 5.34	1 56 51.01
21	1 59 17.99	17.75	+12 10 32.5	31.2	9.352	+50.44	−1 29.56	15 56.50	1 5.40	2 0 47.56
22	2 3 2.63	2.36	12 30 37.2	35.8	9.370	49.93	1 41.46	15 56.25	1 5.47	2 4 44.11
23	2 6 47.73	47.43	12 50 29.6	28.0	9.389	49.41	1 52.91	15 56.00	1 5 54	2 8 40.66
24	2 10 33.29	32.97	13 10 9.1	7.4	9.408	48.88	2 3.91	15 55.75	1 5.61	2 12 37.22
25	2 14 19.34	18.99	13 29 35.7	33.9	9.428	48.33	2 14.43	15 55.50	1 5.68	2 16 33.77
26	2 18 5.87	5.50	+13 48 48.9	47.0	9.449	+47.77	−2 24.44	15 55.25	1 5.75	2 20 30.33
27	2 21 52.91	52.51	14 7 48.5	46.5	9.471	47.20	2 33.95	15 55.00	1 5.82	2 24 26.88
28	2 25 40.46	40.04	14 26 34.2	32.1	9.493	46.61	2 42.96	15 54.75	1 5.90	2 28 23.44
29	2 29 28.54	28.09	14 45 5.8	3.6	9.515	46.01	2 51.43	15 54.50	1 5.97	2 32 19.99
30	2 33 17.17	16.70	15 3 22.7	20.5	9.538	45.40	2 59.35	15 54.25	1 6.05	2 36 16.54
May 1	2 37 6.36	5.87	+15 21 24.9	22.7	9.561	+44.78	−3 6.72	15 54.01	1 6.13	2 40 13.09
2	2 40 56.11	55.60	15 39 12.0	9.7	9.585	44.14	3 13.52	15 53.78	1 6.21	2 44 9.65
3	2 44 46.42	45.89	15 56 43.6	41.3	9.608	43.49	3 19.76	15 53.55	1 6.29	2 48 6.20
4	2 48 37.31	36.76	16 13 59.5	57.2	9.632	42.83	3 25.43	15 53.32	1 6.37	2 52 2.76
5	2 52 28.78	28.21	16 30 59.4	57.0	9.656	42.15	3 30.52	15 53.09	1 6.45	2 55 59.31
6	2 56 20.82	20.24	+16 47 42.9	40.4	9.681	+41.46	−3 35.04	15 52.86	1 6.53	2 59 55.87
7	3 0 13.45	12.86	17 4 9.7	7.2	9.705	40.76	3 38.96	15 52.63	1 6.61	3 3 52.42
8	3 4 6.66	6.06	17 20 19.5	17.0	9.730	40.05	3 42.29	15 52.41	1 6.70	3 7 48.98
9	3 7 60.46	59.85	17 36 12.1	9.6	9.754	39.32	3 45.05	15 52.20	1 6.78	3 11 45.53
10	3 11 54.84	54.22	17 51 47.0	44.5	9.778	38.58	3 47.23	15 51.99	1 6.86	3 15 42.09
11	3 15 49.79	49.17	+18 7 4.1	1.6	9.802	+37.83	−3 48.84	15 51.78	1 6.94	3 19 38.64
12	3 19 45.32	44.69	18 22 2.9	0.5	9.825	37.07	3 49.87	15 51.57	1 7.03	3 23 35.20
13	3 23 41.41	40.78	18 36 43.2	40.8	9.849	36.29	3 50.34	15 51.37	1 7.11	3 27 31.75
14	3 27 38.05	37.42	18 51 4.7	2.4	9.872	35.50	3 50.25	15 51.18	1 7.19	3 31 28.31
15	3 31 35.25	34.62	19 5 7.1	4.8	9.895	34.70	3 49.61	15 50.99	1 7.27	3 35 24.87
16	3 35 33.00	32.37	+19 18 50.0	47.8	9.918	+33.88	−3 48.42	15 50.80	1 7.36	3 39 21.43
17	3 39 31.30	30.67	+19 32 13.2	11.1	9.941	+33.05	−3 46.68	15 50.62	1 7.44	3 43 17.98

NOTE. – For mean time interval of semidiameter passing meridian, subtract 0s.18 from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
May 17	3 39 31.30	30.67	+19 32 13.2	11.1	9.941	+33.05	−3 46.68	15 50.62	1 7.44	3 43 17.98
18	3 43 30.14	29.51	19 45 16.6	14.5	9.963	32.22	3 44.40	15 50.44	1 7.52	3 47 14.54
19	3 47 29.51	28.89	19 57 59.7	57.7	9.985	31.38	3 41.59	15 50.26	1 7.60	3 51 11.09
20	3 51 29.41	28.80	20 10 22.3	20.4	10.007	30.51	3 38.25	15 50.08	1 7.67	3 55 7.65
21	3 55 29.82	29.22	20 22 24.3	22.5	10.028	29.64	3 34.39	15 49.91	1 7.75	3 59 4.20
22	3 59 30.75	30.16	+20 34 5.2	3.5	10.049	+28.76	−3 30.02	15 49.74	1 7.82	4 3 0.76
23	4 3 32.19	31.61	20 45 25.0	23.4	10.070	27.87	3 25.14	15 49.58	1 7.89	4 6 57.31
24	4 7 34.13	33.57	20 56 23.4	21.9	10.091	26.98	3 19.76	15 49.42	1 7.96	4 10 53.87
25	4 11 36.56	36.01	21 6 60.1	58.7	10.112	26.08	3 13.88	15 49.26	1 8.03	4 14 50.43
26	4 15 39.48	38.95	21 17 15.1	13.7	10.132	25.16	3 7.51	15 49.10	1 8.10	4 18 46.99
27	4 19 42.89	42.38	+21 27 8.0	6.7	10.152	+24.24	−3 0.67	15 48.94	1 8.16	4 22 43.54
28	4 23 46.77	46.28	21 36 38.7	37.5	10.171	23.31	2 53.35	15 48.79	1 8.23	4 26 40.10
29	4 27 51.11	50.64	21 45 47.0	45.9	10.190	22.37	2 45.57	15 48.64	1 8.29	4 30 36.65
30	4 31 55.89	55.44	21 54 32.7	31.7	10.208	21.43	2 37.34	15 48.49	1 8.35	4 34 33.21
31	4 36 1.10	0.67	22 2 55.6	54.7	10.226	20.47	2 28.68	15 48.35	1 8.41	4 38 29.76
June 1	4 40 6.74	6.34	+22 10 55.6	54.8	10.244	+19.51	−2 19.60	15 48 21	1 8.46	4 42 26.33
2	4 44 12.78	12.41	22 18 32.4	31.7	10.260	18.54	2 10.12	15 48.07	1 8.51	4 46 22.88
3	4 48 19.21	18.87	22 25 45.9	45.3	10.276	17.57	2 0.24	15 47.94	1 8.56	4 50 19.44
4	4 52 26.03	25.72	22 32 36.0	35.4	10 291	16.59	1 49.98	15 47.81	1 8.61	4 54 15.99
5	4 56 33.19	32.91	22 39 2.5	2.0	10.305	15.61	1 39.37	15 47.69	1 8.66	4 58 12.55
6	5 0 40.67	40.42	+22 45 5.2	4.8	10.318	+14.62	−1 28.44	15 47.58	1 8.70	5 2 9.10
7	5 4 48.46	48.24	22 50 44.0	43.7	10.330	13.62	1 17.20	15 47.47	1 8.74	5 6 5.66
8	5 8 56.54	56.35	22 55 58.8	58.6	10.341	12.62	1 5.69	15 47.36	1 8.78	5 10 2.22
9	5 13 4.87	4.72	23 0 49.5	49.3	10.352	11.61	0 53.92	15 47.25	1 8.81	5 13 58.78
10	5 17 13.43	13.31	23 5 15.9	15.7	10.361	10.60	0 41.92	15 47.15	1 8.84	5 17 55.34
11	5 21 22.19	22.11	+23 9 17.9	17.8	10.369	+ 9.58	−0 29.72	15 47.06	1 8.87	5 21 51.90
12	5 25 31.13	31.08	23 12 55.4	55.4	10.376	8.56	0 17.33	15 46.97	1 8.89	5 25 48.46
13	5 29 40.23	40.22	23 16 8.4	8.4	10.382	7.53	−0 4.78	15 46.88	1 8.91	5 29 45.01
14	5 33 49.46	49.48	23 18 56.8	56.8	10.387	6.50	+0 7.89	15 46.81	1 8.93	5 33 41.57
15	5 37 58.78	58.84	23 21 20.5	20.5	10.391	5.47	0 20.66	15 46.74	1 8.94	5 37 38.13
16	5 42 8.19	8.29	+23 23 19.5	19.5	10.393	+ 4.44	+0 33.51	15 46.67	1 8.96	5 41 34.68
17	5 46 17.65	17.79	23 24 53.6	53.6	10.395	3.41	0 46.42	15 46.61	1 8.97	5 45 31.24
18	5 50 27.14	27.32	23 26 3.0	3.0	10.396	2.38	0 59.35	15 46.55	1 8.97	5 49 27.80
19	5 54 36.64	36.85	23 26 47.6	47.6	10.396	1.34	1 12.29	15 46.50	1 8.97	5 53 24.36
20	5 58 46.12	46.37	23 27 7.3	7.4	10.394	+ 0.30	1 25.22	15 46.45	1 8.97	5 57 20.91
21	6 2 55.58	55.87	+23 27 2.2	2.3	10.392	− 0.74	+1 38.12	15 46.40	1 8.97	6 1 17.47
22	6 7 4.98	5.31	23 26 32.3	32.3	10.389	1.77	1 50.96	15 46.35	1 8.96	6 5 14.03
23	6 11 14.30	14.66	23 25 37.6	37.5	10.386	2.80	2 3.73	15 46.31	1 8.95	6 9 10.59
24	6 15 23.52	23.92	23 24 18.1	18.0	10.382	3.82	2 16.39	15 46.27	1 8.94	6 13 7.14
25	6 19 32.63	33.06	23 22 34.0	33.9	10.377	4.84	2 28.95	15 46.24	1 8.93	6 17 3.70
26	6 23 41.62	42.08	+23 20 25.3	25.1	10.371	− 5.87	+2 41.39	15 46.21	1 8.91	6 21 0.26
27	6 27 50.47	50.97	23 17 52.0	51.7	10 365	6.89	2 53.68	15 46.19	1 8.88	6 24 56.82
28	6 31 59.15	59.69	23 14 54.2	53.8	10.358	7.91	3 5.80	15 46.17	1 8.85	6 28 53.37
29	6 36 7.63	8.21	23 11 31.9	31.4	10.350	8.93	3 17.73	15 46.15	1 8.82	6 32 49.93
30	6 40 15.90	16.51	23 7 45.3	44.7	10.341	9.94	3 29.45	15 46.13	1 8.79	6 36 46.49
31	6 44 23.94	24.58	+23 3 34.4	33.7	10.330	−10.95	+3 40.93	15 46.12	1 8.75	6 40 43.05
32	6 48 31.73	32.40	+22 58 59.4	58.6	10.319	−11.96	+3 52.16	15 46.11	1 8.71	6 44 39.60

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0s.19 from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
July 1	6 44 23.94	24.58	+23 3 34.4	33.7	10.330	−10.95	+3 40.93	15 46.12	1 8.75	6 40 43.05
2	6 48 31.73	32.40	22 58 59.4	58.6	10.319	11.96	3 52.16	15 46.11	1 8.71	6 44 39.60
3	6 52 39.25	39.95	22 53 60.3	59.4	10.307	12.96	4 3.12	15 46.11	1 8.67	6 48 36.16
4	6 56 46.48	47.21	22 48 37.3	36.3	10.294	13.95	4 13.79	15 46.11	1 8.62	6 52 32.71
5	7 0 53.39	54.14	22 42 50.5	49.4	10.281	14.94	4 24.14	15 46.11	1 8.57	6 56 29.27
6	7 4 59.95	60.73	+22 36 40.1	38.9	10.266	−15.92	+4 34.15	15 46.12	1 8.52	7 0 25.83
7	7 9 6.16	6.96	22 30 6.2	4.9	10.251	16.90	4 43.80	15 46.15	1 8.47	7 4 22.39
8	7 13 11.99	12.82	22 23 8.9	7.5	10.234	17.87	4 53.08	15 46.18	1 8.42	7 8 18.94
9	7 17 17.41	18.26	22 15 48.4	46.9	10.217	18.83	5 1.94	15 46.21	1 8.36	7 12 15.50
10	7 21 22.40	23.28	22 8 4.8	3.2	10.199	19.78	5 10.37	15 46.24	1 8.30	7 16 12.06
11	7 25 26.94	27.84	+21 59 58.4	56.6	10.180	−20.73	+5 18.35	15 46.28	1 8.24	7 20 8.62
12	7 29 31.01	31.93	21 51 29.4	27.5	10.160	21.67	5 25.86	15 46.33	1 8.18	7 24 5.18
13	7 33 34.61	35.55	21 42 38.0	36.0	10.140	22.61	5 32.90	15 46.38	1 8.11	7 28 1.74
14	7 37 37.70	38.66	21 33 24.3	22.2	10.118	23.53	5 39.43	15 46.44	1 8.04	7 31 58.29
15	7 41 40.28	41.25	21 23 48.5	46.3	10.096	24.44	5 45.45	15 46.50	1 7.97	7 35 54.85
16	7 45 42.32	43.30	+21 13 51.1	48.7	10.074	−25.34	+5 50.94	15 46.56	1 7.90	7 39 51.40
17	7 49 43.82	44.81	21 3 32.0	29.5	10.051	26.24	5 55.88	15 46.63	1 7.82	7 43 47.96
18	7 53 44.77	45.77	20 52 51.4	48.8	10.028	27.12	6 0.27	15 46.71	1 7.74	7 47 44.51
19	7 57 45.16	46.16	20 41 49.8	47.0	10.004	28.00	6 4.10	15 46.79	1 7.66	7 51 41.07
20	8 1 44.98	45.99	20 30 27.4	24.5	9 982	28.86	6 7.37	15 46.87	1 7.58	7 55 37.62
21	8 5 44.23	45.25	+20 18 44.3	41.3	9.957	−29.72	+6 10.07	15 46.96	1 7.50	7 59 34.18
22	8 9 42.90	43.93	20 6 40.8	37.7	9.933	30.56	6 12.18	15 47.05	1 7.42	8 3 30.74
23	8 13 40.99	42.02	19 54 17.1	13.9	9.909	31.40	6 13.70	15 47.14	1 7.34	8 7 27.30
24	8 17 38.49	39.52	19 41 33.6	30.3	9.885	32.22	6 14.65	15 47.23	1 7.26	8 11 23.85
25	8 21 35.41	36.44	19 28 30.4	27.0	9.860	33.03	6 15.02	15 47.33	1 7.17	8 15 20.41
26	8 25 31.75	32.78	+19 15 7.9	4.4	9.836	−33.83	+6 14.80	15 47.43	1 7.09	8 19 16.96
27	8 29 27.51	28.53	19 1 26.3	22.7	9.811	34.62	6 13.99	15 47.53	1 7.00	8 23 13.52
28	8 33 22.69	23.70	18 47 25.8	22.1	9.787	35.41	6 12.60	15 47.64	1 6.92	8 27 10.07
29	8 37 17.27	18.28	18 33 6.6	2.9	9.763	36.18	6 10.64	15 47.75	1 6.83	8 31 6.63
30	8 41 11.27	12.27	18 18 29.1	25.4	9.739	36.93	6 8.09	15 47.87	1 6.74	8 35 3.18
31	8 45 4.69	5.68	+18 3 33.7	29.9	9.714	−37.68	+6 4.95	15 47.99	1 6.65	8 38 59.74
Aug. 1	8 48 57.52	58.50	17 48 20.5	16.7	9.690	38.41	6 1.22	15 48.11	1 6.57	8 42 56.29
2	8 52 49.76	50.73	17 32 49.8	45.9	9.665	39.13	5 56.90	15 48.24	1 6.48	8 46 52.85
3	8 56 41.42	42.37	17 16 61.9	58.0	9.641	39.84	5 52.00	15 48.37	1 6.39	8 50 49.40
4	9 0 32.49	33.42	17 0 57.1	53.2	9.616	40.54	5 46.51	15 48.50	1 6.30	8 54 45.96
5	9 4 22.97	23.88	+16 44 35.8	31.9	9.592	−41.22	+5 40.44	15 48.64	1 6.21	8 58 42.51
6	9 8 12.86	13.75	16 27 58.2	54.3	9.567	41.89	5 33.77	15 48.79	1 6.13	9 2 39.07
7	9 12 2.17	3.04	16 11 4.6	0.7	9.543	42.56	5 26.52	15 48.94	1 6.04	9 6 35.62
8	9 15 50.90	51.75	15 53 55.4	51.6	9.518	43.21	5 18.69	15 49.09	1 5.96	9 10 32.18
9	9 19 39.04	39.87	15 36 30.9	27.1	9.494	43.84	5 10.27	15 49.26	1 5.87	9 14 28.73
10	9 23 26.60	27.40	+15 18 51.3	47.5	9.470	−44.46	+5 1.27	15 49.43	1 5.79	9 18 25.29
11	9 27 13.58	14.35	15 0 56.9	53.2	9.446	45.07	4 51.70	15 49.60	1 5.71	9 22 21.84
12	9 30 59.99	60.72	14 42 48.3	44.7	9.422	45.65	4 41.56	15 49.77	1 5.63	9 26 18.40
13	9 34 45.83	46.53	14 24 25.6	22.1	9.398	46.23	4 30.85	15 49.95	1 5.55	9 30 14.95
14	9 38 31.11	31.78	14 5 49.2	45.8	9.375	46.80	4 19.58	15 50.13	1 5.47	9 34 11.51
15	9 42 15.84	16.48	+13 46 59.4	56.1	9.352	−47.35	+4 7.75	15 50.31	1 5.40	9 38 8.06
16	9 46 0.04	0.65	+13 27 56.5	53.3	9.330	−47.88	+3 55.39	15 50.50	1 5.33	9 42 4.62

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0ˢ.19 from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Decli-nation.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
Aug. 16	9 46 0.04	0.65	+13 27 56.5	53.3	9.330	−47.88	+ 3 55.39	15 50.50	1 5.33	9 42 4.62
17	9 49 43.71	44.29	13 8 40.8	37.7	9.309	48.41	3 42.50	15 50.69	1 5.26	9 46 1.17
18	9 53 26.86	27.40	12 49 12.7	9.8	9.283	48.92	3 29.10	15 50.89	1 5.19	9 49 57.73
19	9 57 9.51	10.01	12 29 32.5	29.7	9.267	49.42	3 15.20	15 51.09	1 5.12	9 53 54.28
20	10 0 51.68	52.14	12 9 40.4	37.8	9.247	49.91	3 0.82	15 51.29	1 5.05	9 57 50.83
21	10 4 33.38	33.80	+11 49 36.7	34.3	9.228	−50.38	+ 2 45.97	15 51.49	1 4.98	10 1 47.38
22	10 8 14.62	15.00	11 29 21.9	19.7	9.209	50.84	2 30.66	15 51.69	1 4.92	10 5 43.94
23	10 11 55.43	55.77	11 8 56.1	54.1	9.191	51.29	2 14.92	15 51.89	1 4.85	10 9 40.49
24	10 15 35.84	36 14	10 48 19.7	17.9	9.175	51.73	1 58.77	15 52.10	1 4.79	10 13 37.05
25	10 19 15.84	16.10	10 27 33.0	31.4	9.159	52.16	1 42.21	15 52.31	1 4.73	10 17 33.60
26	10 22 55.45	55.67	+10 6 36.3	34.9	9.143	−52.57	+ 1 25.27	15 52.52	1 4.67	10 21 30.16
27	10 26 34.71	34.88	9 45 29.8	28.7	9.128	52.96	1 7.98	15 52.74	1 4.61	10 25 26.71
28	10 30 13.62	13.75	9 24 14.0	13.2	9.114	53.35	0 50.35	15 52.96	1 4.56	10 29 23.26
29	10 33 52.20	52.29	9 2 49.1	48.5	9.101	53.72	0 32.38	15 53.18	1 4.51	10 33 19.81
30	10 37 30.47	30.51	8 41 15.4	15.1	9.088	54.08	+ 0 14.10	15 53.40	1 4.46	10 37 16.37
31	10 41 8.44	8.43	+ 8 19 33.3	33.3	9.076	−54.42	− 0 4.48	15 53.62	1 4.41	10 41 12.92
Sept. 1	10 44 46.13	46.08	7 57 43.0	43.4	9.065	54.76	0 23.34	15 53.85	1 4.37	10 45 9.47
2	10 48 23.55	23.45	7 35 44.9	45.6	9.054	55.07	0 42.47	15 54.08	1 4.33	10 49 6.02
3	10 52 0.72	0.57	7 13 39.3	40.3	9.044	55.38	1 1.85	15 54.32	1 4.29	10 53 2.58
4	10 55 37.65	37.45	6 51 26.6	27.9	9.034	55.67	1 21.47	15 54.55	1 4.25	10 56 59.13
5	10 59 14.35	14.10	+ 6 29 7.1	8.7	9.025	−55.95	− 1 41.31	15 54.79	1 4.22	11 0 55.69
6	11 2 50.85	50.55	6 6 41.1	43.0	9.016	56.21	2 1.37	15 55.03	1 4.19	11 4 52.24
7	11 6 27.15	26.80	5 44 9.1	11.3	9.009	56.46	2 21.62	15 55.28	1 4.17	11 8 48.79
8	11 10 3.26	2.86	5 21 31.3	33.8	9.002	56.69	2 42.04	15 55.53	1 4.15	11 12 45.34
9	11 13 39.22	38.76	4 58 48.1	50.9	8.995	56.90	3 2.64	15 55.79	1 4.13	11 16 41.90
10	11 17 15.03	14.52	+ 4 35 59.8	63.0	8.989	−57.11	− 3 23.38	15 56.05	1 4.11	11 20 38.45
11	11 20 50.70	50.14	4 13 6.8	10.4	8.984	57.30	3 44.25	15 56.31	1 4.10	11 24 35.00
12	11 24 26.26	25.65	3 50 9.4	13.3	8.980	57.47	4 5.23	15 56.57	1 4.08	11 28 31.55
13	11 28 1.73	1.07	3 27 7.9	12.2	8.976	57.63	4 26.31	15 56.83	1 4.07	11 32 28.10
14	11 31 37.11	36.40	3 4 2.8	7.4	8.974	57.78	4 47.48	15 57.09	1 4.06	11 36 24.65
15	11 35 12.44	11.68	+ 2 40 54.3	59.3	8.972	−57.92	− 5 8.70	15 57.36	1 4 06	11 40 21.21
16	11 38 47.74	46.93	2 17 42.8	48.1	8.971	58.03	5 29.95	15 57.63	1 4.06	11 44 17.76
17	11 42 23.03	22.16	1 54 28.6	34.2	8.970	58.14	5 51.20	15 57.90	1 4.06	11 48 14.32
18	11 45 58.33	57.41	1 31 12.0	18.0	8.971	58.24	6 12.44	15 58.17	1 4.06	11 52 10.87
19	11 49 33.67	32.69	1 7 53.4	59.8	8.974	58.31	6 33.65	15 58.44	1 4.07	11 56 7.42
20	11 53 9.06	8.03	+ 0 44 33.0	39.8	8.977	−58.38	− 6 54.80	15 58.71	1 4.08	12 0 3.97
21	11 56 44.54	43.46	+ 0 21 11.2	18.3	8.981	58.43	7 15.87	15 58.98	1 4.09	12 4 0.52
22	12 0 20.13	19 00	− 0 2 11.7	4.3	8.986	58.47	7 36.84	15 59.25	1 4.11	12 7 57.07
23	12 3 55.85	54.67	0 25 35.4	27.6	8.992	58.49	7 57.67	15 59.52	1 4.13	12 11 53.63
24	12 7 31.73	30.49	0 48 59.5	51.4	8.999	58.51	8 18.34	15 59.79	1 4.15	12 15 50.18
25	12 11 7.78	6.48	− 1 12 23.7	15.2	9.007	−58.51	− 8 38.84	16 0.06	1 4.18	12 19 46.74
26	12 14 44.03	42.68	1 35 47.8	38.9	9.016	58.49	8 59.13	16 0.33	1 4.21	12 23 43.29
27	12 18 20 51	19.10	1 59 11.3	2.1	9.025	58.46	9 19.20	16 0.60	1 4.25	12 27 39.84
28	12 21 57.24	55.78	2 22 34.0	24.5	9.036	58.42	9 39.03	16 0.87	1 4.28	12 31 36.39
29	12 25 34.23	32.72	2 45 55.4	45.6	9.048	58.36	9 58.59	16 1.14	1 4.32	12 35 32.94
30	12 29 11.50	9.94	− 3 9 15.3	5.2	9.060	−58.29	−10 17.86	16 1.41	1 4.36	12 39 29.49
31	12 32 49.08	47.47	− 3 32 33.3	22.9	9.073	−58.20	−10 36.83	16 1.68	1 4.40	12 43 26.05

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0ˢ.18 from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
Oct. 1	12 32 49.08	47.47	− 3 32 33.3	22.9	9.073	−58.20	−10 36.83	16 1.68	1 4.40	12 43 26.05
2	12 36 26.98	25.32	3 55 49.0	38.4	9 087	58.10	10 5[illegible].48	16 1.95	1 4.44	12 47 22.60
3	12 40 5.21	3.50	4 18 62.1	51.3	9.101	57.98	11 13.79	16 2.23	1 4.49	12 51 19.15
4	12 43 43.80	42.04	4 42 12.1	1.1	9.116	57.85	11 31.75	16 2.50	1 4.54	12 55 15.70
5	12 47 22.76	20.96	5 5 18.6	7.3	9.131	57.70	11 49.35	16 2.78	1 4.60	12 59 12.26
6	12 51 2.11	0.26	− 5 28 21.4	9.8	9.148	−57.53	−12 6.56	16 3.06	1 4.66	13 3 8.81
7	12 54 41.86	39.96	5 51 20.1	8.2	9.165	57.35	12 23.36	16 3.34	1 4.72	13 7 5.36
8	12 58 22.02	20.08	6 14 14.0	2.0	9.183	57.15	12 39.75	16 3.62	1 4.79	13 11 1.91
9	13 2 2.62	0.64	6 36 63.0	50.7	9.201	56.94	12 55.70	16 3.90	1 4.86	13 14 58.47
10	13 5 43.68	41.65	6 59 46.7	34.2	9.220	56.70	13 11.19	16 4.18	1 4.92	13 18 55.02
11	13 9 25.21	23.14	− 7 22 24.6	12.0	9.240	−56.45	−13 26.21	16 4.47	1 5.00	13 22 51.57
12	13 13 7.23	5.12	7 44 56.4	43.6	9.261	56.19	13 40.75	16 4.75	1 5.08	13 26 48.12
13	13 16 49.75	47.60	8 7 21.6	8.7	9.283	55.91	13 54.79	16 5.03	1 5.16	13 30 44.68
14	13 20 32.79	30.60	8 29 39.9	26.8	9.305	55.61	14 8.31	16 5.31	1 5.24	13 34 41.23
15	13 24 16.37	14.14	8 51 50.9	37.7	9.328	55.30	14 21.29	16 5.60	1 5.32	13 38 37.79
16	13 27 60.51	58.24	− 9 13 54.3	41.0	9.352	−54.97	−14 33.70	16 5.88	1 5.40	13 42 34.34
17	13 31 45.24	42.94	9 35 49.6	36.2	9.376	54.62	14 45.53	16 6.15	1 5.49	13 46 30.89
18	13 35 30.57	28.23	9 57 36.5	23.0	9.402	54.27	14 56.76	16 6.43	1 5.58	13 50 27.44
19	13 39 16.52	14.15	10 19 14.5	0.9	9.428	53.90	15 7.36	16 6.70	1 5.67	13 54 24.00
20	13 43 3.12	0.72	10 40 43.4	29.7	9.455	53.50	15 17.32	16 6.97	1 5.77	13 58 20.55
21	13 46 50.37	47.94	−11 1 62.8	49.1	9.483	−53.10	−15 26.63	16 7.24	1 5.87	14 2 17.10
22	13 50 38.30	35.84	11 22 72.2	58.5	9.512	52.68	15 35.26	16 7.51	1 5.97	14 6 13.65
23	13 54 26.94	24.46	11 43 71.4	57.7	9.541	52.24	15 43.19	16 7.77	1 6.07	14 10 10.21
24	13 58 16.29	13.79	12 4 59.9	46.3	9.572	51.79	15 50.40	16 8.03	1 6.17	14 14 6.76
25	14 2 6.38	3.85	12 25 37.4	23.8	9.603	51.33	15 56.87	16 8.29	1 6.28	14 18 3.32
26	14 5 57.22	54.66	−12 45 63.5	49.9	9.634	−50.84	−16 2.60	16 8.54	1 6.38	14 21 59.87
27	14 9 48.81	46.23	13 6 17.7	4.2	9.666	50.34	16 7.57	16 8.79	1 6.49	14 25 56.43
28	14 13 41.18	38.58	13 26 19.7	6.3	9.699	49.82	16 11.76	16 9.04	1 6.60	14 29 52.98
29	14 17 34.34	31.72	13 45 69.1	55.8	9.732	49.28	16 15.16	16 9.29	1 6.71	14 33 49.54
30	14 21 28.29	25.65	14 5 45.5	32.3	9.765	48.73	16 17.77	16 9.54	1 6.82	14 37 46.09
31	14 25 23.05	20.39	−14 24 68.5	55.4	9.799	−48.17	−16 19.58	16 9.78	1 6.93	14 41 42.64
Nov. 1	14 29 18.62	15.95	14 44 17.6	4.6	9.832	47.59	16 20.57	16 10.03	1 7.05	14 45 39.19
2	14 33 15.00	12.32	15 2 72.4	59.6	9.866	46.99	16 20.75	16 10.27	1 7.17	14 49 35.75
3	14 37 12.20	9.51	15 21 52.5	39.8	9.900	46.36	16 20.11	16 10.51	1 7.29	14 53 32.30
4	14 41 10.23	7.53	15 40 17.4	4.9	9.935	45.71	16 18.64	16 10.75	1 7.41	14 57 28.86
5	14 45 9.09	6.39	−15 58 26.8	14.5	9.969	−45.06	−16 16.35	16 10.99	1 7.52	15 1 25.41
6	14 49 8.78	6.08	16 16 20.1	8.0	10.004	44.38	16 13.23	16 11.23	1 7.64	15 5 21.97
7	14 53 9.30	6.60	16 33 57.0	45.1	10.038	43.68	16 9.27	16 11.47	1 7.76	15 9 18.52
8	14 57 10.64	7.95	16 51 17.1	5.5	10.073	42.98	16 4.49	16 11.71	1 7.88	15 13 15.08
9	15 1 12.82	10.13	17 8 20.0	8.6	10.107	42.25	15 58.88	16 11.95	1 8.00	15 17 11.63
10	15 5 15.82	13.14	−17 24 65.2	54.1	10.142	−41.51	−15 52.44	16 12.18	1 8.12	15 21 8.19
11	15 9 19.65	16.98	17 41 32.3	21.5	10.177	40.74	15 45.17	16 12.41	1 8.24	15 25 4.74
12	15 13 24.33	21.67	17 57 40.8	30.4	10.212	39.96	15 37.06	16 12.63	1 8.36	15 29 1.30
13	15 17 29.83	27.19	18 13 30.4	20.4	10.246	39.17	15 28.12	16 12.85	1 8.48	15 32 57.85
14	15 21 36.16	33.54	18 28 60.9	51.1	10.281	38.35	15 18.36	16 13.07	1 8.60	15 36 54.41
15	15 25 43.31	40.71	−18 44 11.7	2.2	10.315	−37.53	−15 7.77	16 13.28	1 8.72	15 40 50.97
16	15 29 51.29	48.72	−18 58 62.4	53.3	10.350	−36.69	−14 56.35	16 13.49	1 8.84	15 44 47.52

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0s.18 from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
Nov. 16	15 29 51.29	48.72	−18 58 62.4	53.3	10.350	−36.69	−14 56.35	16 13.49	1 8.84	15 44 47.52
17	15 33 60.10	57.56	19 13 32.7	23.9	10.384	35.83	14 44.10	16 13.70	1 8.95	15 48 44.07
18	15 38 9.74	7.23	19 27 42.2	33.8	10.419	34.96	14 31.02	16 13.90	1 9.06	15 52 40.63
19	15 42 20.20	17.72	19 41 30.7	22.6	10.453	34.07	14 17.13	16 14.10	1 9.17	15 56 37.18
20	15 46 31.47	29.02	19 54 57.8	50.0	10.487	33.16	14 2.42	16 14.29	1 9.28	16 0 33.74
21	15 50 43.55	41.14	−20 7 63.0	55.6	10.521	−32.25	−13 46.90	16 14.48	1 9.39	16 4 30.29
22	15 54 56.44	54.07	20 20 46.0	39.0	10.554	31.32	13 30.57	16 14.66	1 9.50	16 8 26.85
23	15 59 10.12	7.79	20 33 6.6	0.0	10.587	30.38	13 13.44	16 14.84	1 9.61	16 12 23.41
24	16 3 24.59	22.30	20 44 64.4	58.1	10.620	29.42	12 55.53	16 15.01	1 9.72	16 16 19.97
25	16 7 39.83	37.59	20 56 39.0	33.0	10.652	28.45	12 36 85	16 15.17	1 9.82	16 20 16.52
26	16 11 55.83	53.64	−21 7 50.1	44.5	10.682	−27.47	−12 17.41	16 15.33	1 9.92	16 24 13.08
27	16 16 12.58	10.44	21 18 37.4	32.1	10.712	26.48	11 57.22	16 15.49	1 10.01	16 28 9.64
28	16 20 30.04	27.96	21 28 60.6	55.7	10.742	25.47	11 36.32	16 15.65	1 10.11	16 32 6.20
29	16 24 48.21	46.19	21 38 59.4	54.8	10.771	24.44	11 14.71	16 15.81	1 10.20	16 36 2.75
30	16 29 7.06	5.10	21 48 33.4	29.2	10.799	23.40	10 52.42	16 15.96	1 10.29	16 39 59.31
Dec. 1	16 33 26.57	24.67	−21 57 42.4	38.5	10.826	−22.35	−10 29.47	16 16.11	1 10.38	16 43 55.87
2	16 37 46.71	44.88	22 6 26.0	22.5	10.851	21.29	10 5.89	16 16.25	1 10.46	16 47 52.43
3	16 42 7.45	5.69	22 14 44.0	40.8	10.875	20.21	9 41.70	16 16.39	1 10.53	16 51 48.98
4	16 46 28.77	27.08	22 22 36.2	33.3	10.899	19.13	9 16.93	16 16.53	1 10.60	16 55 45.54
5	16 50 50.63	49.02	22 29 62.2	59.6	10.921	18.05	8 51.61	16 16.66	1 10.68	16 59 42.09
6	16 55 13.02	11.48	−22 36 61.8	59.5	10.942	−16.95	− 8 25.78	16 16.79	1 10.75	17 3 38.65
7	16 59 35.88	34.41	22 43 34.8	32.7	10.962	15.83	7 59.48	16 16.92	1 10.82	17 7 35.21
8	17 3 59.19	57.80	22 49 40.9	39.0	10.981	14 71	7 32.72	16 17.04	1 10.88	17 11 31.77
9	17 8 22.94	21.63	22 55 19.9	18.3	10.997	13.58	7 5.53	16 17.16	1 10.94	17 15 28.32
10	17 12 47.07	45.84	23 0 31.7	30.3	11.013	12.43	6 37.94	16 17.27	1 11.00	17 19 24.88
11	17 17 11.56	10.41	−23 5 16.1	14.9	11.028	−11.28	− 6 10.00	16 17.38	1 11.05	17 23 21.44
12	17 21 36.38	35.32	23 9 33.1	32.1	11.041	10.13	5 41.73	16 17.49	1 11.10	17 27 18.00
13	17 26 1.51	0.54	23 13 22.3	21.5	11.052	8.98	5 13.15	16 17.59	1 11.14	17 31 14.56
14	17 30 26.91	26.03	23 16 43.6	43.0	11.063	7.82	4 44.30	16 17.69	1 11.18	17 35 11.12
15	17 34 52.55	51.76	23 19 37.1	36.6	11.073	6.65	4 15.21	16 17.78	1 11.21	17 39 7.67
16	17 39 18.39	17.69	−23 22 2.6	2.2	11.080	− 5.48	− 3 45.92	16 17 86	1 11.23	17 43 4.23
17	17 43 44.41	43.80	23 23 59.9	59.6	11.087	4.31	3 16.44	16 17.93	1 11.25	17 47 0.78
18	17 48 10.59	10.07	23 25 29.1	28.9	11.093	3.13	2 46.81	16 18.00	1 11.27	17 50 57.34
19	17 52 36.89	36.46	23 26 30.1	29.9	11.098	1.96	2 17.06	16 18.07	1 11.28	17 54 53.90
20	17 57 3.28	2.94	23 27 2.8	2.7	11.101	− 0.78	1 47.22	16 18.13	1 11.29	17 58 50.46
21	18 1 29.73	29.48	−23 27 7.3	7.3	11.103	+ 0.40	− 1 17.32	16 18.18	1 11.30	18 2 47.02
22	18 5 56.23	56.07	23 26 43.6	43.6	11.104	1.58	0 47.37	16 18.23	1 11.30	18 6 43.58
23	18 10 22.72	22 65	23 25 51.6	51.6	11.104	2.75	− 0 17.42	16 18.27	1 11.30	18 10 40.13
24	18 14 49.18	49.20	23 24 31.3	31.3	11.102	3.93	+ 0 12.50	16 18.30	1 11.29	18 14 36.69
25	18 19 15.57	15.68	23 22 42.8	42.8	11.098	5.10	0 42.34	16 18.33	1 11.28	18 18 33.25
26	18 23 41.86	42.07	−23 20 26.1	26.0	11.093	+ 6.28	+ 1 12.08	16 18.35	1 11.26	18 22 29.81
27	18 28 8.03	8.33	23 17 41.3	41.1	11.087	7.45	1 41.70	16 18.37	1 11.23	18 26 26.36
28	18 32 34.03	34.42	23 14 28.5	28.2	11.079	8.61	2 11.16	16 18.38	1 11.20	18 30 22.92
29	18 36 59.83	60.31	23 10 47.7	47.3	11.070	9.77	2 40.40	16 18.39	1 11.17	18 34 19.48
30	18 41 25.38	25.95	23 6 39.0	38.5	11.059	10.93	3 9.40	16 18.40	1 11.14	18 38 16.04
31	18 45 50.66	51.32	−23 2 2.6	2.0	11.047	+12.08	+ 3 38.14	16 18.40	1 11.10	18 42 12.59
32	18 50 15.61	16.39	−22 56 58.6	57.8	11.033	+13.24	+ 4 6.57	16 18.40	1 11.05	18 46 9.15

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0s.19 from the sidereal interval.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Centre.	Diff. for 1 Hour of Long.	Geocentric Declination of Centre.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Jan. 1	14 36.60	2.217	9 22 10.48	143.26	+16 10 58.4	−465.9	68.48	15 48.8	57 55.6	II. S.
2	15 29.24	2.168	10 18 53.80	140.30	12 36 52.7	−599.1	67.81	15 55.4	58 19.8	II. S.
3	16 20.73	2.125	11 14 28.16	137.71	8 16 43.1	−695.2	67.22	16 1.0	58 40.3	II. S.
4	17 11.42	2.104	12 9 14.08	136.41	+ 3 26 4 2	−750.9	66.93	16 5.5	58 57.0	II. S.
5	18 1.95	2.113	13 3 50.62	136.98	− 1 38 21.5	−763.8	67.09	16 9.0	59 9.9	II. S.
6	18 53.10	2.156	13 59 5.11	139.55	− 6 39 5.3	−732.2	67.71	16 11.4	59 18.5	II. S.
7	19 45.64	2.226	14 55 42.27	143.76	−11 17 51.1	−653.8	68 74	16 12.2	59 21.6	II. S.
8	20 40.03	2.307	15 54 11.57	148.69	−15 15 53.3	−528.7	69.89	16 11.2	59 18.0	II. S.
9	21 36.31	2.377	16 54 33.73	152.90	−18 15 15.4	−361.9	70.84	16 8.0	59 6.2	II. S.
10	22 33.83	2.407	17 56 11.38	154.72	−20 1 33.7	−166 1	71.22	16 2.4	58 45.6	II. S.
11	23 31.42	2.381	18 57 52.78	153.11	−20 27 13.7	+ 37.5	70.80	15 54.5	58 16.5	
13	0 27.67	2.298	19 58 13.14	148.09	−19 33 36.6	226.8	69.56	15 44.3	57 40.2	
14	1 21.41	2.177	20 56 2.86	140.81	−17 30 16.8	384.0	67.81	15 33.5	56 59.5	I. S.
15	2 12.05	2.044	21 50 46.71	132.86	−14 31 49.9	501.7	65.85	15 22.1	56 17.6	I. S.
16	2 59.63	1.924	22 42 25.67	125.59	−10 54 8.1	580.7	64.03	15 11.3	55 37.9	I. S.
17	3 44.60	1.829	23 31 27 51	119.87	− 6 51 46.3	+626.1	62.57	15 1.9	55 3.3	I. S.
18	4 27.67	1.767	0 18 35.53	116.14	− 2 36 58.5	643.7	61.63	14 54.6	54 36.5	I. S.
19	5 9.68	1.740	1 4 39.96	114.59	+ 1 40 13.5	638.8	61.24	14 49.9	54 19.3	I. S.
20	5 51.51	1.750	1 50 32.61	115.18	5 51 16.5	613.3	61.43	14 48.2	54 12.9	I. S.
21	6 33.98	1.794	2 37 4.82	117.85	9 48 7.8	567.5	62.15	14 49.5	54 17.9	I. S.
22	7 17.90	1.870	3 25 3.88	122.37	+13 22 20.3	+499.4	63.33	14 53.8	54 33.6	I. S.
23	8 3.93	1.969	4 15 9.56	128.30	16 24 19.5	405.8	64.83	15 1.0	54 59.8	I. S.
24	8 52.49	2.079	5 7 47.78	134.92	18 43 10.8	283.4	66.48	15 10.4	55 34.4	I. S.
25	9 43.66	2.182	6 3 2.83	141.17	20 7 12.8	+132.1	67.98	15 21.4	56 15.0	I. S.
26	10 37.04	2.260	7 0 31.38	145.65	20 25 40.2	− 43.0	69.08	15 33.3	56 58.6	I. S.
27	11 31.83	2.297	7 59 24.07	148.09	+19 31 18.8	−229.5	69.59	15 45.0	57 41.5	I. N.
28	12 26.98	2.291	8 58 38.35	147.73	17 22 59.7	−409.8	69.49	15 55.5	58 20.3	I. S.
29	13 21.55	2.253	9 57 18.62	145.43	14 6 53.1	−565.7	68.95	16 4.1	58 51.8	II. S.
30	14 15.04	2 204	10 54 53.05	142.44	9 55 43.2	−682.9	68.26	16 10.1	59 13.9	II. S.
31	15 7.39	2.162	11 51 19.23	139.91	+ 5 6 38.7	−754.2	67.69	16 13.5	59 26.3	II. S.
Feb. 1	15 58.99	2.143	12 46 59.91	138.74	− 0 1 8.8	−776 5	67.46	16 14.3	59 29.3	II. S.
2	16 50.45	2.152	13 42 32.88	139.31	− 5 8 10.1	−750.7	67.65	16 13.0	59 24.5	II. S.
3	17 42.48	2.189	14 38 39.72	141.52	− 9 55 33.5	−678.9	68.23	16 10.0	59 13.5	II. S.
4	18 35.64	2.244	15 35 54.46	144.83	−14 5 31.4	−564.2	69.05	16 5.8	58 57.8	II. S.
5	19 30.18	2.298	16 34 32.16	148.22	−17 21 57.0	−412.2	69.85	16 0.5	58 38.5	II. S.
6	20 25.87	2.336	17 34 19.49	150.41	−19 31 37.5	−232.4	70.33	15 54.4	58 16.1	II. S.
7	21 22.00	2.333	18 34 32.95	150.26	−20 26 8.3	− 39.2	70.22	15 47.5	57 50.9	II. N.
8	22 17.50	2.283	19 34 8.91	147.28	−20 3 39.5	+149.4	69.43	15 39.8	57 22.7	II. N.
9	23 11.30	2.195	20 32 3.41	141.94	−18 29 24.5	317.0	68.06	15 31.6	56 52.2	
11	0 2.70	2.085	21 27 31.46	135.29	−15 54 19.2	452.3	66.37	15 22.8	56 20.1	
12	0 51.38	1.973	22 20 16.70	128.55	−12 32 27.4	+550.8	64.65	15 14.0	55 47.7	I. S.
13	1 37.52	1.876	23 10 29.28	122.71	− 8 38 27.5	613 6	63.15	15 5.6	55 16.9	I. S.
14	2 21.61	1.803	23 58 38.10	118.32	− 4 25 52.2	644.6	62.03	14 58.2	54 49.6	I. S.
15	3 4.30	1.760	0 45 22.99	115.74	− 0 6 25.3	648.6	61.40	14 52.3	54 28.0	I. S.
16	3 46.33	1.749	1 31 28.71	115.06	+ 4 9 51.6	+629.2	61.28	14 48.5	54 13.9	I. S.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Centre.	Diff. for 1 Hour of Long.	Geocentric Declination of Centre.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Feb. 16	3 46.33	1.749	1 31 28.71	115.06	+ 4 9 51.6	+629.2	61.28	14 48.5	54 13.9	I. S.
17	4 28.49	1.770	2 17 41.42	116.31	8 14 10.0	588.8	61.69	14 47.1	54 8.9	I. S.
18	5 11.51	1.821	3 4 46.25	119.38	11 58 9.4	527.8	62.56	14 48.6	54 14.5	I. S.
19	5 56.08	1.898	3 53 24.41	124.03	15 13 15.0	444.1	63.83	14 53.1	54 30.9	I. S.
20	6 42.75	1.994	4 44 9.23	129.84	17 50 5.0	335.9	65.34	15 0.6	54 58.4	I. S.
21	7 31.86	2.098	5 37 20.37	136.09	+19 38 23.5	+201.0	66.91	15 10.8	55 36.1	I. S.
22	8 23.40	2.193	6 32 57 36	141.81	20 27 39.1	+ 41.3	68.29	15 23.4	56 22.4	I. N.
23	9 16.96	2.263	7 30 36.02	146.07	20 8 43.4	−138.2	69.27	15 37.5	57 14.2	I. N.
24	10 11.79	2.298	8 29 31.72	148.19	18 36 4.0	−324.7	69.73	15 52.1	58 7.7	I. N.
25	11 7.03	2.299	9 28 52.17	148.20	15 50 12.7	−501.0	69.68	16 5.8	58 57.9	I. N.
26	12 1.97	2.276	10 27 53.86	146.78	+11 58 57.3	−648.9	69.31	16 17.2	59 39.8	I. N.
27	12 56.23	2.246	11 26 14.84	144.99	7 16 48.0	−752.5	68.88	16 25.1	60 8.9	II. S.
28	13 49.85	2.225	12 23 57.57	143.73	+ 2 4 7.5	−802.4	68.60	16 28.9	60 22.9	II. S.
29	14 43.19	2.224	13 21 23.46	143.65	− 3 17 12.8	−794.9	68.63	16 28.4	60 20.9	II. S.
Mar. 1	15 36.75	2.243	14 19 2.41	144.81	− 8 26 58.0	−731.7	69.00	16 24.1	60 5.3	II. S.
2	16 30.97	2.277	15 17 21.09	146.86	−12 56 7.1	−619.4	69.55	16 17.0	59 38.9	II. S.
3	17 26.06	2.312	16 16 31.74	148 97	−16 34 40.1	−467 4	70.11	16 7.9	59 5.8	II. S.
4	18 21.83	2 331	17 16 23.77	150.13	−19 6 23.5	−287.7	70.40	15 57.9	58 28.8	II. S.
5	19 17.71	2.318	18 16 22.26	149.39	−20 23 13.5	− 95.7	70.19	15 47.6	57 51.3	II. N.
6	20 12.84	2.269	19 15 35.82	146.38	−20 23 25.7	+ 92.7	69.40	15 37.7	57 14.9	II. N.
7	21 6.36	2.187	20 13 12.18	141.40	−19 11 25.7	+263.2	68.11	15 28.4	56 40.5	II. N.
8	21 57.64	2.085	21 8 33.60	135.29	−16 56 33.3	405.9	66.50	15 19.6	56 8.4	II. N.
9	22 46.41	1.981	22 1 24.96	129.04	−13 51 5.7	515.8	64.84	15 11.6	55 38.9	II. N.
10	23 32.82	1.889	22 51 53.25	123.48	−10 8 24.0	592.3	63.34	15 4.3	55 12.1	
12	0 17.23	1.817	23 40 22.10	119.16	− 6 1 30.5	637.1	62.18	14 57.9	54 48.4	
13	1 0.22	1.770	0 27 25.08	116.36	− 1 4 2 28.5	+653.5	61.44	14 52.4	54 28.3	I. S.
14	1 42.42	1.751	1 13 40.78	115.22	+ 2 37 50.0	644.0	61.17	14 48.2	54 13.1	I. S.
15	2 24.51	1.760	1 59 49.21	115.75	6 49 35 4	611.1	61.38	14 45.7	54 3.8	I. S.
16	3 7.12	1.795	2 46 29.52	117.86	10 43 39.9	555.8	62.01	14 44.9	54 0.7	I. S.
17	3 50.86	1.854	3 34 17.86	121.40	14 11 13.6	478.3	63.04	14 47.0	54 8.4	I. S.
18	4 36.24	1.931	4 23 44.67	126.01	+17 3 21.2	+378.4	64.31	14 51.4	54 24.6	I. S.
19	5 23.61	2.018	5 15 10.86	131.24	19 10 52.9	255.3	65.74	14 58.6	54 51.1	I. S.
20	6 13.08	2.104	6 8 43.67	136.44	20 24 34.7	+109.5	67.08	15 8.7	55 28.1	I. N.
21	7 4.49	2.177	7 4 13.57	140.86	20 35 53.5	− 55.7	68.18	15 21.4	56 14.8	I. N.
22	7 57.43	2.228	8 1 14.93	143.98	19 38 18.1	−233.4	68.91	15 36.2	57 9.2	I. N.
23	8 51.28	2.256	8 59 12.63	145.58	+17 29 0.2	−412.0	69.25	15 52.3	58 8.3	I. N.
24	9 45.55	2.263	9 57 33.08	145.96	14 10 28.9	−576.9	69.26	16 8.3	59 7.0	I. N.
25	10 39.82	2.260	10 55 54.71	145.82	9 51 32.7	−711.5	69.19	16 22.7	59 59.9	I. N.
26	11 34.05	2.262	11 54 14.27	145.92	+ 4 47 22.4	−800.6	69.18	16 33 8	60 40.7	I. N.
27	12 28.48	2.277	12 52 45.39	146.84	− 0 41 15.6	−832.2	69.39	16 40.2	61 4.3	II. N.
28	13 23.48	2.309	13 51 51.15	148.80	− 6 9 52.2	−799.9	69.91	16 41.1	61 7.8	II. S.
29	14 19.41	2.353	14 51 52.82	151.40	−11 12 49.9	−705.0	70.60	16 36.8	60 51.8	II. S.
30	15 16.39	2.393	15 52 57.09	153.82	−15 26 30.7	−555.8	71.30	16 27.9	60 19.1	II. S.
31	16 14.10	2.411	16 54 45.86	154.92	−18 32 17.1	−368.6	71.57	16 15.9	59 35.0	II. S.
32	17 11.81	2.390	17 56 34.43	153.68	−20 18 58.0	−164.0	71.32	16 2.2	58 44.8	II. N. S.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Centre.	Diff. for 1 Hour of Long.	Geocentric Declination of Centre.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Apr. 1	17 11.81	2.390	17 56 34.43	153.68	−20 18 58.0	−164.0	71.32	16 2.2	58 44.8	II. N. S.
2	18 8.50	2.326	18 57 21.80	149.84	−20 43 48.7	+ 37.3	70.40	15 48.2	57 53.4	II. N.
3	19 3.20	2.227	19 55 45.68	143.86	−19 52 20.2	218.5	68.92	15 34.9	57 4.6	II. N.
4	19 55.27	2.110	20 52 18.44	136.81	−17 53 2.4	369.4	67.11	15 23.0	56 20.8	II. N.
5	20 44.50	1.994	21 45 35.67	129.84	−15 0 37.5	486.9	65.26	15 12.6	55 42.6	II. N.
6	21 31.11	1.893	22 36 17.78	123.75	−11 27 52.3	+571.7	63.60	15 3.9	55 10.8	II. N.
7	22 15.56	1.816	23 24 48.91	119.10	− 7 27 25.7	626.0	62 30	14 56.9	54 44.9	II. N.
8	22 58.49	1.766	0 11 47.79	116.09	− 3 10 51.4	652.4	61.44	14 51.4	54 24.8	II. N.
9	23 40.55	1.744	0 57 54.88	114.78	+ 1 11 12.6	653.6	61.05	14 47.3	54 9.8	
11	0 22.41	1.749	1 43 50.44	115.10	5 28 50.2	630 5	61.14	14 44.9	54 1.0	
12	1 4.72	1.781	2 30 12.36	116.96	+ 9 32 27.5	+583.7	61.67	14 43.5	53 55.9	I. S.
13	1 48.04	1.852	3 17 34.21	120.05	13 12 38.8	513.3	62.56	14 44.1	53 57.9	I. N. S.
14	2 32.77	1.898	4 6 22.78	124.11	16 19 59.4	419.3	63.68	14 46.2	54 6.6	I. S.
15	3 19.24	1.974	4 56 55.21	128.64	18 45 10.0	302.2	64.96	14 50.9	54 23.0	I. S.
16	4 7.51	2.047	5 49 16.02	133.03	20 19 16.5	164.5	66.17	14 57.7	54 47.9	I. N.
17	4 57.43	2.109	6 43 15.59	136.76	+20 54 26.2	+ 8.9	67.18	15 6.9	55 21.7	I. N.
18	5 48.61	2.152	7 38 31.92	139.38	20 24 43.0	−158.7	67.87	15 18.6	56 4.7	I. N.
19	6 40.61	2.177	8 34 36.76	140.84	18 47 2.4	−329.3	68.25	15 32.5	56 55.7	I. N.
20	7 32.99	2.186	9 31 4.70	141.40	16 2 5.1	−493.3	68.35	15 48.1	57 52.9	I. N.
21	8 25.52	2 192	10 27 41.93	141.72	12 14 53.4	−638.8	68.38	16 4.3	58 52.6	I. N.
22	9 18.26	2.205	11 24 31.24	142.52	+ 7 35 19.5	−752.9	68.52	16 20.0	59 50.1	I. N.
23	10 11.51	2.237	12 21 51.77	144.41	+ 2 18 27.4	−822.9	68.93	16 33.2	60 38.8	I. N.
24	11 5.78	2.290	13 20 13.57	147.63	− 3 15 24.9	−836.0	69.69	16 42.5	61 12.8	I. N.
25	12 1.59	2.363	14 20 7.62	151.96	− 8 41 31.3	−783.2	70.74	16 46.4	61 27.0	I. N.
26	12 59.22	2.439	15 21 51.68	156.61	−13 32 49.7	−662.6	71.86	16 44.2	61 19.2	II. N.
27	13 58.51	2.495	16 25 14.86	159.98	−17 23 50.5	−484.3	72.71	16 36.4	60 50.5	II. S.
28	14 58.62	2.504	17 29 28.06	160.55	−19 55 21.0	−269.6	72.90	16 24.2	60 5.7	II. N. S.
29	15 58.23	2.452	18 33 10.88	157.39	−20 58 17.2	− 46.3	72.22	16 9.2	59 10.6	II. N.
30	16 55.89	2 345	19 34 56.48	150.93	−20 34 45.4	+159.2	70.72	15 53.2	58 11.6	II. N.
May 1	17 50.53	2.206	20 33 40.85	142.56	−18 55 30.9	330.5	68.68	15 37.5	57 14.0	II. N.
2	18 41.74	2.062	21 28 58.01	133.92	−16 15 39.6	+462 2	66.50	15 23.2	56 21.6	II. N.
3	19 29.65	1.935	22 20 57.45	126.26	−12 50 49.5	556.2	64.48	15 11.0	55 36.8	II. N.
4	20 14.84	1.836	23 10 12.33	120.32	− 8 55 7.1	617.2	62.84	15 1.1	55 0.3	II. N.
5	20 58.03	1.769	23 57 27.36	116.30	− 4 40 37.5	650.8	61.69	14 53.6	54 32.5	II. N.
6	21 40.03	1.736	0 43 30.83	114.30	− 0 17 47.8	659.5	61.09	14 48.2	54 13.0	II. N.
7	22 21.62	1.735	1 29 9.84	114.24	+ 4 3 53.0	+645.1	61.02	14 44.9	54 0.8	II. N.
8	23 3.53	1.762	2 15 7.97	115.88	8 15 13.7	607.7	61.42	14 43.4	53 55.4	II. N.
9	23 46.39	1.813	3 2 3.13	118.94	12 6 53.3	546.5	62.24	14 43.6	53 56.1	
11	0 30.69	1.881	3 50 25.05	123.03	15 29 9.2	460.6	63.34	14 45.4	54 2.6	
12	1 16.74	1.957	4 40 31.99	127.58	18 12 5.2	350.1	64.58	14 48.7	54 14.8	I. N. S.
13	2 4.59	2.029	5 32 27.26	131.94	+20 6 3.7	+216.5	65.76	14 53.5	54 32.6	I. N.
14	2 54.01	2.086	6 25 57.64	135.39	21 2 40.1	+ 64 2	66.70	15 0.1	54 56.7	I. N.
15	3 44.56	2.122	7 20 35.59	137.52	20 55 47.3	− 99.8	67.32	15 8.4	55 27.3	I. N.
16	4 35.67	2.133	8 15 46.93	138.21	19 42 33.0	−266.3	67.55	15 18.7	56 4.9	I. N.
17	5 26.83	2.128	9 11 1.50	137.88	+17 23 47.7	−426.0	67.50	15 30.6	56 48.8	I. N.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Centre.	Diff. for 1 Hour of Long.	Geocentric Declination of Centre.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
May 17	5 26.83	2.128	9 11 1.50	137.88	+17 23 47.7	−426.0	67.50	15 30.6	56 48.8	I. N.
18	6 17.78	2.118	10 6 3.08	137.28	14 4 2.5	−569.6	67.36	15 44.1	57 38.3	I. N.
19	7 8.56	2.117	11 0 54.91	137.22	9 51 15.1	−689.4	67.33	15 58.5	58 31.2	I. N.
20	7 59.56	2.138	11 55 59.67	138.45	+ 4 56 48.6	−776.4	67.60	16 12.9	59 23.9	I. N.
21	8 51.40	2.188	12 51 55.09	141.47	− 0 24 10.2	−820.4	68.31	16 25.9	60 11.8	I. N.
22	9 44.82	2.270	13 49 26.00	146.38	− 5 52 17.3	−810.4	69.47	16 36.1	60 49.4	
23	10 40.50	2.373	14 49 12.44	152.64	−11 3 54.9	−736.7	70.95	16 42.0	61 11.1	I. N.
24	11 38.74	2.478	15 51 32.79	158.92	−15 32 40.1	−596.4	72.44	16 42.6	61 13.1	I. N.
25	12 39.17	2.549	16 56 5.06	163 25	−18 53 15.9	−398.5	73.47	16 37.5	60 54.5	II. N.
26	13 40.60	2.556	18 1 37.56	163.68	−20 47 9.4	−167.8	73.60	16 27.3	60 17.0	II. N.
27	14 41.26	2.485	19 6 23.62	159.41	−21 7 30.6	+ 63.5	72.65	16 13.5	59 26.2	II. N.
28	15 39.41	2.353	20 8 38.87	151.40	−20 0 14.5	266.4	70.80	15 57.6	58 27.9	II. N.
29	16 33.96	2.192	21 7 17.10	141.68	−17 40 18.6	425.6	68.46	15 41.4	57 28.2	II. N.
30	17 24.63	2.034	22 2 2.11	132.23	−14 26 1.9	538.7	66.09	15 26.1	56 32.3	II. N.
31	18 11.80	1.903	22 53 17.13	124.34	−10 34 46.2	611.6	64.04	15 12.7	55 43.1	II. N.
June 1	18 56.25	1.808	23 41 47.89	118.60	− 6 21 4.0	+652.0	62.49	15 1.8	55 3.1	II. N.
2	19 38.87	1.751	0 28 28.64	115.19	− 1 56 38.1	666 1	61.52	14 53.6	54 32.9	II. N.
3	20 20.58	1.731	1 14 14.44	113.98	+ 2 28 48.0	657.3	61.14	14 48.2	54 12.8	II. N.
4	21 2.23	1.746	1 59 57.24	114.89	6 46 29.0	627.3	61.33	14 45.2	54 2.0	II. N.
5	21 44.61	1.790	2 46 23.48	117.57	10 47 44.5	575.1	62.00	14 44.6	53 59.8	II. N.
6	22 28.35	1.858	3 34 11.74	121.64	+14 23 22.0	+498.7	63.04	14 46.0	54 5.0	II. N.
7	23 13.90	1.939	4 23 48.81	126.53	17 23 25.6	397.1	64.30	14 49.2	54 16.7	
9	0 1.44	2.021	5 15 25.37	131.45	19 37 39.1	270.0	65.57	14 53.8	54 33.6	
10	0 50.81	2.089	6 8 51.92	135.54	20 56 23.4	+120.6	66.63	14 59.6	54 55.0	I. N.
11	1 41.51	2.131	7 3 39.08	138.07	21 12 4.8	− 43.9	67.31	15 6.6	55 20.6	I. N.
12	2 32.85	2.142	7 59 4.39	138.72	+20 20 44.2	−212.8	67.53	15 14.6	55 49.9	I. N.
13	3 24.11	2.126	8 54 25.16	137.79	18 22 47.6	−375.1	67.34	15 23.5	56 22.7	I. N.
14	4 14.81	2.098	9 49 12.03	136 07	15 23 2.3	−520.3	66.97	15 33.4	56 59.1	I. N.
15	5 4.83	2.073	10 43 17.68	134.52	11 29 49.3	−641.1	66.63	15 44.1	57 38.4	I. N.
16	5 54.43	2.065	11 36 58.24	134.11	6 54 10.0	−731.5	66.54	15 55.3	58 19.6	I. N.
17	6 44.20	2.088	12 30 49.48	135.49	+ 1 49 20.7	−786.1	66.89	16 6.5	59 0.7	I. N.
18	7 34.96	2 150	13 25 39.99	139.08	− 3 28 53.0	−797.3	67.77	16 17.0	59 38.9	I. N.
19	8 27.57	2.243	14 22 22.00	144.75	− 8 41 44.2	−757.8	69.14	16 25.5	60 10.3	I. N.
20	9 22.75	2.359	15 21 38.58	151.78	−13 27 12.9	−659.7	70.80	16 31.1	60 31.0	I. N.
21	10 20.77	2.473	16 23 45.63	158.60	−17 21 16.1	−501.2	72.39	16 32.8	60 37.0	I. N.
22	11 21.12	2.546	17 28 12.87	163.07	−20 1 21.7	−292.8	73.41	16 29.8	60 26.3	I. N.
23	12 22.42	2.547	18 33 37.39	163.14	−21 11 56.8	− 59.1	73.43	16 22.5	59 59.2	II. N.
24	13 22.75	2.467	19 38 3.98	158.29	−20 49 20.0	+167.8	72.31	16 11.2	59 17.7	II. N.
25	14 20.37	2.327	20 39 47.26	149.86	−19 2 18.5	359.6	70.33	15 57.4	58 27.0	II. N.
26	15 14.27	2.164	21 37 46.62	140.04	−16 8 1.9	503.2	67.95	15 42.5	57 32.5	II. N.
27	16 4.31	2.010	22 31 53.41	130.77	−12 26 9.8	+598.5	65.66	15 27.9	56 38.9	II. N.
28	16 50.97	1.885	23 22 37.41	123.26	− 8 14 38.6	653.0	63.72	15 14.7	55 50.2	II. N.
29	17 35.09	1.799	0 10 48.56	118.07	− 3 48 6.7	675.0	62.35	15 3.6	55 9.7	II. N.
30	18 17.62	1.752	0 57 23.87	115.28	+ 0 41 56.0	671.4	61.59	14 55.2	54 38.7	II. N.
31	18 59.50	1.744	1 43 20.29	114.80	+ 5 6 6.6	+646.0	61.44	14 49.7	54 18.4	II. N.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Centre.	Diff. for 1 Hour of Long.	Geocentric Declination of Centre.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
July 1	18 59.50	1.744	1 43 20.29	114.80	+ 5 6 6.6	+646.0	61.44	14 49.7	54 18.4	II. N.
2	19 41.62	1.772	2 29 31.18	116.43	9 16 1.1	600.0	61.86	14 47.1	54 8.8	II. N.
3	20 24.78	1.829	3 16 43.77	119.87	13 3 14.1	532.2	62.74	14 47.1	54 9.1	II. N.
4	21 9.58	1.908	4 5 35.89	124.64	16 18 39 2	440.7	63.94	14 49.7	54 18.5	II. N.
5	21 56.43	1.997	4 56 31.32	130.01	18 52 19.6	323.3	65.29	14 54.4	54 35.7	II. N.
6	22 45.40	2.081	5 49 33.92	135.06	+20 34 0.0	+181.2	66.54	15 0.7	54 58.7	II. N.
7	23 36.15	2.143	6 44 24.06	138.83	21 14 26.8	+ 18.4	67.46	15 8.2	55 26.3	
9	0 28.02	2.172	7 40 21.28	140.58	20 47 20.5	−154.9	67.89	15 16.4	55 56.4	
10	1 20.16	2.166	8 36 34.38	140.20	19 10 58.0	−325.9	67.84	15 25.2	56 27.8	I. N.
11	2 11.80	2.134	9 32 18.33	138.29	16 28 56.5	−480 9	67.39	15 33.5	56 59.2	I. N.
12	3 2.55	2.094	10 27 7.78	135.85	+12 49 41.3	−610.3	66.83	15 41.9	57 30.1	I. N
13	3 52.39	2.062	11 21 3.21	132.95	8 25 7.1	−706.6	66.41	15 50.0	57 59.9	I. N.
14	4 41.74	2.055	12 14 29.07	133.51	+ 3 29 19.3	−766.1	66.33	15 57.7	58 28.2	I. N.
15	5 31.31	2.081	13 8 7.44	135.05	− 1 42 7.7	−784.3	66.76	16 4.8	58 54.3	I. N.
16	6 21.92	2.143	14 2 49.41	138.81	− 6 52 13.2	−758.2	67.72	16 11.0	59 17.2	I. N.
17	7 14.43	2.238	14 59 25 30	144 42	−11 42 13.8	−683.3	69.11	16 15.9	59 34.9	I. N.
18	8 9.44	2.347	15 58 30.99	151.07	−15 51 48.8	−556.1	70.67	16 18.8	59 45.7	I. N.
19	9 7.01	2.445	17 0 11.21	156.99	−19 0 20.6	−379.1	72.05	16 19.2	59 47.1	I. N.
20	10 6.46	2.498	18 3 45.02	160.20	−20 50 10.4	−166.8	72.76	16 16.5	59 37.4	I. N.
21	11 6.39	2 481	19 7 46.74	159.19	−21 11 9.2	+ 60.2	72.47	16 10.7	59 16.0	I. S.
22	12 5.02	2.393	20 10 30.93	153.86	−20 4 1.2	+270.4	71.19	16 1.9	58 43.8	I. S.
23	13 0.91	2.259	21 10 29.99	145.74	−17 39 59.1	442.2	69.22	15 50.8	58 3.0	II. N.
24	13 53.32	2.109	22 6 59.64	136.76	−14 16 43.4	565.9	67.01	15 38.5	57 17.8	II. N.
25	14 42.25	1.973	23 0 0.56	128.55	−10 13 27.9	643 0	64.96	15 25.9	56 31.6	II. N.
26	15 28.26	1.867	23 50 4.77	122.13	− 5 47 34.5	680.5	63.33	15 14.1	55 48.0	II. N.
27	16 12.13	1.796	0 38 0.83	117.91	− 1 13 18.2	+686.4	62.24	15 3.9	55 10.5	II. N.
28	16 54.76	1.763	1 24 42.39	115.93	+ 3 17 58.0	666 5	61.75	14 56.0	54 41.5	II. N.
29	17 37.06	1.767	2 11 3.75	116.18	7 36 56.7	625.0	61.84	14 50.8	54 22.4	II. N.
30	18 19.86	1 804	2 57 55.26	118.42	11 35 14.5	562.9	62.45	14 48.5	54 14.1	II. N.
31	19 3.89	1.869	3 46 1.18	122.31	15 4 29.4	479.5	63.48	14 49.2	54 16.7	II. N.
Aug. 1	19 49.73	1.953	4 35 55.66	127.36	+17 55 43.6	+372 6	64.77	14 52.8	54 29.7	II. N.
2	20 37.69	2 043	5 27 57.56	132.78	19 59 17.5	241.1	66.11	14 58.8	54 52.1	II. N.
3	21 27.73	2.124	6 22 4.76	137.64	21 5 30.7	+ 86.3	67.28	15 7.0	55 21.9	II. N.
4	22 19.43	2.179	7 17 51.74	140.96	21 6 9.7	− 85 3	68.06	15 16.5	55 57.0	II. S.
5	23 12 05	2.199	8 14 34.09	142.20	19 56 28.3	−263.0	68.32	15 26.8	56 34.9	II. S.
7	0 4.75	2.187	9 11 21.48	141.45	+17 36 51.6	−432.6	68.12	15 37.1	57 12.7	
8	0 56.87	2.154	10 7 33.61	139.44	14 13 31.9	−579.4	67.63	15 46.6	57 47.6	
9	1 48.10	2.117	11 2 52.28	137.18	9 57 52.7	−692.5	67.11	15 54.9	58 17.9	I. N.
10	2 38.56	2.092	11 57 24.53	135.71	+ 5 4 56.3	−764.8	66.78	16 1.5	58 42.3	I. N.
11	3 28.71	2.093	12 51 38.77	135.77	− 0 8 2.9	−792.5	66.85	16 6.4	59 0.1	I. N.
12	4 19.26	2.126	13 46 16.80	137.72	− 5 22 45.0	−773.9	67.40	16 9.5	59 11.7	I. N.
13	5 10.97	2.189	14 42 4.26	141.51	−10 20 14.6	−706.3	68.39	16 11.1	59 17.3	I. N.
14	6 4.47	2.272	15 39 39.39	146.55	−14 41 24.1	−591.7	69.65	16 11.1	59 17.6	I. N.
15	7 0.04	2.357	16 39 19.61	151.68	−18 7 38.0	−432.5	70.89	16 9.8	59 12.5	I. N.
16	7 57.43	2.418	17 40 48.77	155.33	−20 22 38.4	−237.9	71.70	16 6.6	59 1.8	I. N.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Centre.	Diff. for 1 Hour of Long.	Geocentric Declination of Centre.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Aug. 16	7 57.43	2.418	17 40 48.77	155.33	−20 22 38.4	−237.9	71.70	16 6.6	59 1.8	I. N.
17	8 55.72	2.429	18 43 12.13	156.02	−21 15 16.6	− 24.0	71.82	16 2.4	58 45.4	I. S.
18	9 53.55	2.380	19 45 7.99	153.06	−20 42 24.9	+185.8	71.05	15 56.3	58 23 0	I. S.
19	10 49.56	2.280	20 45 14.22	147.06	−18 49 59.6	370.5	69.54	15 48.6	57 54.7	I. S.
20	11 42.80	2.155	21 42 34.41	139.49	−15 51 19.1	515.7	67.64	15 39.6	57 21.6	I. S.
21	12 32.97	2 028	22 36 49.22	131.85	−12 3 32.2	+615.9	65.70	15 29.7	56 45.4	II. N.
22	13 20.28	1.919	23 28 12 04	125.30	− 7 44 14.7	673.9	64.01	15 19.5	56 8.0	II. N.
23	14 5.30	1.838	0 17 17.26	120.46	− 3 9 19.6	695.1	62.78	15 9.8	55 32.4	II. N.
24	14 48.78	1.791	1 4 49.72	117.58	+ 1 27 48.5	685.9	62.07	15 1.3	55 1.0	II. N.
25	15 31.52	1.776	1 51 37.50	116.73	5 56 3.1	651.3	61.90	14 54.5	54 36.1	II. N.
26	16 14.29	1.793	2 38 27.77	117.76	+10 5 56.5	+594.5	62.24	14 50.1	54 19.8	II. N.
27	16 57.83	1.839	3 26 3.86	120.50	13 48 52.9	516.7	63.02	14 48.3	54 13.4	II. N.
28	17 42.75	1.907	4 15 2.47	124.57	16 56 25.6	417.4	64.14	14 49.6	54 18.0	II. N.
29	18 29.46	1.988	5 5 49.65	129.43	19 19 51.0	295.9	65.40	14 53.6	54 32.9	II. N.
30	19 18.16	2.070	5 58 36.13	134.38	20 50 13.2	+152.4	66.62	15 0.7	54 59.0	II. N.
31	20 8.72	2.139	6 53 13.18	138.54	+21 19 7.3	− 10.6	67.65	15 10.3	55 34.3	II. S.
Sept. 1	21 0.64	2.183	7 49 14.53	141 25	20 40 2.2	−186 1	68.27	15 21.9	56 16.9	II. S.
2	21 53.29	2.199	8 45 59.30	142.19	18 50 4.9	−362.8	68.43	15 34.7	57 3.6	II. S.
3	22 46.02	2.191	9 42 47.88	141.65	15 51 27.3	−527.0	68.25	15 47.5	57 50.8	II. S.
4	23 38.35	2.170	10 39 12.99	140.37	11 52 4.9	−664.4	67.90	15 59.4	58 34.3	
6	0 30.18	2.151	11 35 7.78	139.29	+ 7 5 13.2	−762 7	67.63	16 9.2	59 10.3	
7	1 21.74	2.149	12 30 43.37	139.14	+ 1 48 22.3	−812.9	67.62	16 16.1	59 35.9	I. N.
8	2 13.52	2.171	13 26 38.56	140.46	− 3 38 9.9	−810.0	68.00	16 19.8	59 49.4	I. N.
9	3 6.14	2.218	14 23 20.69	143.29	− 8 52 46.6	−752.9	68.77	16 20.2	59 51.0	I. N.
10	4 0.12	2.283	15 21 24 89	147.19	−13 33 56.2	−644.0	69.80	16 17.8	59 42.1	I. N.
11	4 55.75	2.349	16 21 6.58	151.20	−17 21 43.3	−487.9	70.82	16 13.1	59 24.9	I. N.
12	5 52.73	2.395	17 22 13.31	154 03	−19 59 37.6	−296.9	71.53	16 6.9	59 2.0	I. N.
13	6 50.42	2.402	18 24 0.43	154.38	−21 16 43 1	− 87.0	71.60	15 59.6	58 35.4	I. S.
14	7 47.64	2.357	19 25 19.95	151.71	−21 9 28.8	+121.4	70.91	15 51.8	58 6.7	I. S.
15	8 43.22	2.269	20 25 1.41	146.38	−19 42 21.3	309.5	69.54	15 43.7	57 36.7	I. S.
16	9 36.36	2.156	21 22 13.89	139.55	−17 6 19.6	+464.4	67.77	15 35.3	57 6.0	I. S.
17	10 26.66	2.038	22 16 36.83	132.44	−13 36 15.3	579.4	65.91	15 26.9	56 35.0	I. S.
18	11 14.28	1.934	23 8 18.39	126.21	− 9 28 13.1	654.4	64.26	15 18.5	56 4.3	I. S.
19	11 59.69	1.854	23 57 46.64	121.41	− 4 57 40.5	692.5	62.97	15 10.4	55 34.5	I. S.
20	12 43.52	1.803	0 45 40.29	118.35	− 0 18 34.3	697.9	62.17	15 2.8	55 6.6	II. N.
21	13 26.48	1.782	1 32 41.95	117.07	+ 4 16 50.4	+674.7	61.86	14 56.2	54 42.4	II. N.
22	14 9.29	1.799	2 19 33.81	117.50	8 37 49.0	626.3	62.04	14 51.0	54 23.3	II. N.
23	14 52.58	1.822	3 6 54.85	119.47	12 34 42.3	554.5	62.64	14 47.6	54 10.9	II. N.
24	15 36.91	1.875	3 55 18.41	122.66	15 58 32.2	461.0	63.57	14 46.5	54 6.9	II. N.
25	16 22.69	1.942	4 45 9.36	126.67	18 40 42.3	346.1	64.69	14 48.0	54 12.4	II. N.
26	17 10.13	2.012	5 36 40.52	130.93	+20 32 53.6	+211.4	65.84	14 52.4	54 28.5	II. N.
27	17 59.23	2.077	6 29 50.75	134.81	21 27 22.5	+ 58.4	66.86	14 59.7	54 55.3	II. S.
28	18 49.70	2.126	7 24 23.92	137.76	21 17 44.1	−108.3	67.60	15 9.9	55 32.7	II. S.
29	19 41.11	2.154	8 19 53.15	139.47	19 59 54.9	−281.2	67.98	15 22.5	56 19.1	II. S.
30	20 32.95	2.164	9 15 49.08	140.04	+17 33 20.1	−450.3	68.06	15 37.0	57 12.2	II. S.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Centre.	Diff. for 1 Hour of Long.	Geocentric Declination of Centre.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Oct. 1	21 24.87	2.163	10 11 49.45	139.94	+14 1 48.5	−603.9	67.98	15 52.2	58 8.1	II. S.
2	22 16.75	2.162	11 7 46.94	139.91	9 34 5.7	−728.8	67.91	16 6.9	59 2.2	II. S.
3	23 8.74	2.174	12 3 51.70	140.66	+ 4 24 4.2	−813.2	68.06	16 19.6	59 48.7	
5	0 1.27	2.208	13 0 28.79	142.66	− 1 9 33.2	−845.2	68.55	16 28.9	60 22.9	
6	0 54.89	2.264	13 58 11.00	146.05	− 6 44 4.0	−816.8	69.42	16 33.8	60 40.8	I. N.
7	1 50.08	2.337	14 57 28.04	150.46	−11 54 30.1	−724.9	70.56	16 34.1	60 41.0	I. N.
8	2 47.06	2.409	15 58 32.76	154.82	−16 16 9.8	−574.3	71.66	16 29.4	60 24.7	I. N.
9	3 45.54	2.457	17 1 7.98	157.74	−19 27 56.7	−378.5	72.43	16 21.3	59 55.1	I. N.
10	4 44.66	2.458	18 4 21.38	157.81	−21 15 43.2	−158.3	72.50	16 11.0	59 17.0	I. N.
11	5 43.13	2.404	19 6 55.94	154.50	−21 34 41.0	+ 62.0	71.73	15 59.4	58 34.4	I. S.
12	6 39.68	2.302	20 7 34.37	148.32	−20 29 25.3	+259.7	70.22	15 47.6	57 51.2	I. S.
13	7 33.41	2.174	21 5 23.53	140.64	−18 11 32.7	423.3	68.27	15 36.3	57 9.8	I. S.
14	8 24.02	2.046	22 0 5.14	132.91	−14 56 12.3	547.0	66.25	15 26.0	56 31.9	I. S.
15	9 11.72	1.934	22 51 51.81	126.21	−10 59 12.6	631.9	64.44	15 16.7	55 57.7	I. S.
16	9 57.06	1.850	23 41 16.07	121.12	− 6 35 23.5	682.2	63.02	15 8.6	55 27.7	I. S.
17	10 40.73	1.795	0 29 0.11	117.87	− 1 58 6.6	+699.9	62.10	15 1.4	55 1.6	I. S.
18	11 23.48	1.772	1 15 48.47	116.46	+ 2 40 36.8	689.3	61.70	14 55.5	54 39.6	I. S.
19	12 6 02	1.777	2 2 24.14	116.77	7 9 46.9	652.4	61.78	14 50.6	54 21.6	II. S.
20	12 48.98	1.807	2 49 25.52	118.57	11 19 5.4	590.1	62.29	14 47.0	54 8.6	II. S.
21	13 32.90	1.856	3 37 24.32	121.49	14 58 44.1	503.9	63.13	14 44.9	54 0.9	II. N.
22	14 18.14	1.915	4 26 42.79	125.12	+17 59 21.1	+395.3	64.16	14 44.7	54 0.1	II. N.
23	15 4.87	1.978	5 17 31.16	128.88	20 12 12.3	265.7	65.23	14 46.5	54 6.8	II. S.
24	15 53.04	2.034	6 9 45.79	132.21	21 29 35.2	+118.7	66.16	14 50.8	54 22.4	II. S.
25	16 42.37	2.073	7 3 9.99	134.61	21 45 26.3	− 41.0	66.84	14 57.7	54 47.7	II. S.
26	17 32.43	2.095	7 57 18.64	135.91	20 55 59.7	−206.6	67.20	15 7.3	55 23.1	II. S.
27	18 22.81	2.101	8 51 46.03	136.25	+19 0 19.4	−370.9	67.29	15 19.5	56 8.0	II. S.
28	19 13.21	2.099	9 46 14.67	136.06	16 0 38.7	−525.2	67.23	15 34.1	57 1.4	II. S.
29	20 3.58	2.101	10 40 41.99	136.25	12 2 33.3	−661.2	67.21	15 50.0	58 0.2	II. S.
30	20 54.18	2.119	11 35 22.55	137.34	7 15 21.2	−769.0	67.43	16 6.5	59 0.4	II. S.
31	21 45.49	2.163	12 30 46.70	139.96	+ 1 52 37.1	−837.0	68.03	16 21.8	59 56.6	II. S.
Nov. 1	22 38.21	2.236	13 27 34.92	144.35	− 3 47 9.8	−852.1	69.08	16 34.1	60 42.0	II. S.
2	23 33.01	2.335	14 26 28.47	150.31	− 9 20 29.1	−803.0	70.52	16 41.9	61 10.5	
4	0 30.35	2.444	15 27 54.58	156.86	−14 20 8.3	−683.4	72.12	16 44.4	61 19.7	
5	1 30.15	2.533	16 31 48.97	162.29	−18 18 36.3	−499.1	73.45	16 40.9	61 6.8	I. N.
6	2 31.53	2.569	17 37 18.56	164.49	−20 53 24.7	−269.6	74.03	16 32.2	60 34.9	I. N.
7	3 32.91	2.531	18 42 47.91	162.15	−21 52 37.6	− 26.8	73.55	16 19.7	59 49.1	I. S.
8	4 32.47	2.422	19 46 27.85	155.57	−21 17 23.7	+197.9	72.04	16 5.2	58 55.7	I. S.
9	5 28.82	2.271	20 46 55.13	146.46	−19 19 44.6	383.0	69.85	15 50.1	58 0.2	I. S.
10	6 21.40	2.112	21 43 34.62	136.90	−16 17 18.9	521.6	67.45	15 35.7	57 7.3	I. S.
11	7 10.34	1.972	22 36 35 67	128.46	−12 28 27.4	615.9	65.25	15 22.8	56 19.9	I. S.
12	7 56.28	1.863	23 26 36.27	121.96	− 8 9 32.6	+672.8	63.48	15 11.6	55 39.1	I. S.
13	8 40.07	1.792	0 14 27.19	117.66	− 3 34 19.9	698.4	62.26	15 2.6	55 5.8	I. S.
14	9 22.59	1.757	1 1 1.96	115.57	+ 1 5 29.9	696.4	61.62	14 55.5	54 39.6	I. S.
15	10 4.69	1.756	1 47 11.30	115.50	5 39 33.3	669.6	61.55	14 50.1	54 20.1	I. S.
16	10 47.11	1.783	2 33 40.38	117.18	+ 9 57 58.2	+618.4	61.96	14 46.5	54 6.7	I. S.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Centre.	Diff. for 1 Hour of Long.	Geocentric Declination of Centre.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Nov. 16	10 47.11	1.783	2 33 40.38	117.18	+ 9 57 58.2	+618.4	61.96	14 46.5	54 6.7	I. S.
17	11 30.48	1.834	3 21 6.25	120.17	13 50 56.8	542.4	62.75	14 44.4	53 58.9	I. S.
18	12 15.23	1.897	4 9 55.20	123.97	17 8 38.0	442.1	63.78	14 43.7	53 56.5	II. S.
19	13 1.56	1.963	5 0 19.24	127.98	19 41 25.2	318.4	64.86	14 44.6	53 59.6	II. S.
20	13 49.40	2.020	5 52 13.68	131.41	21 20 36.9	174.8	65.80	14 47.0	54 8.6	II. S.
21	14 38.38	2.057	6 45 17.42	133.67	+21 59 24.4	+ 17.3	66.46	14 51.3	54 24.4	II. S.
22	15 27.98	2.071	7 38 58.24	134.49	21 33 45.7	−146.6	66.74	14 57.6	54 47.4	II. S.
23	16 17.64	2.064	8 32 42.56	134.03	20 2 58.3	−306.8	66.69	15 6.0	55 18.5	II. S.
24	17 6.96	2.045	9 26 6.26	132.89	17 29 34.5	−457.8	66.44	15 16.7	55 57.8	II. S.
25	17 55.82	2.029	10 19 2.61	131.90	13 58 56.5	−592.2	66.20	15 29.6	56 45.0	II. S.
26	18 44.46	2.028	11 11 45.16	131.88	+ 9 38 49.3	−704.3	66.19	15 44.3	57 38.9	II. S.
27	19 33.40	2.056	12 4 46.34	133.55	+ 4 39 25.9	−787.3	66.59	15 59.9	58 36.4	II. S.
28	20 23.44	2.120	12 58 53.19	137.40	− 0 45 53.3	−832.1	67.52	16 15.5	59 33.6	II. S.
29	21 15.47	2.223	13 55 0.56	143.58	− 6 19 35.0	−826.9	69.01	16 29.4	60 24.8	II. S.
30	22 10.37	2.357	14 54 0.12	151.61	−11 39 2.7	−759.0	70.93	16 40.0	61 3.5	II. S.
Dec. 1	23 8.64	2.498	15 56 22.33	169.14	−16 17 7.3	−619.6	72.95	16 45.6	61 24.2	
3	0 10.03	2.608	17 1 52.36	166.81	−19 45 35.7	−413.2	74.51	16 45.3	61 23.0	
4	1 13.25	2.643	18 9 12.68	168.95	−21 41 42.8	−163.4	75.04	16 39.0	60 59.8	I. S.
5	2 16.17	2.582	19 16 14.47	165.25	−21 55 26.9	+ 91.6	74.23	16 27.6	60 17.9	I S.
6	3 16.57	2.441	20 20 45.10	156.69	−20 32 29.1	315.2	72.27	16 12.8	59 23.6	I. S.
7	4 13.02	2.261	21 21 17.30	145.86	−17 50 13.5	+486.4	69.67	15 56.4	58 23.4	I. S.
8	5 5.11	2 084	22 17 28.07	135.24	−14 10 37.9	602.8	67.06	15 40.0	57 23.4	I. S.
9	5 53.30	1.938	23 9 43.97	126.46	− 9 54 19.3	671.4	64.80	15 25.0	56 28.1	I. S.
10	6 38.46	1.833	23 58 57.82	120.14	− 5 18 5.6	703.6	63.10	15 12.0	55 40.5	I. S.
11	7 21.62	1.771	0 46 10.98	116.39	− 0 35 21.4	706.1	62.03	15 1.2	55 1.9	I. S.
12	8 3.78	1.749	1 32 23.88	115.07	+ 4 3 30.7	+684 4	61.63	14 53.6	54 33.0	I. S.
13	8 45.85	1.762	2 18 31.73	115.91	8 29 9.9	640.2	61.80	14 48.3	54 13.2	I. S.
14	9 28.62	1.806	3 5 21.87	118.53	12 32 38.5	573.3	62.45	14 45.2	54 2.0	I. S.
15	10 12.71	1.871	3 53 31.00	122.39	16 4 40.1	482.8	63.43	14 44.2	53 58.2	I. S.
16	10 58.49	1.945	4 43 21.52	126.83	18 55 35.8	367.9	64.56	14 44.9	54 0.8	I. S.
17	11 46.01	2.013	5 34 57.04	130.99	+20 55 54.5	+230.2	65.64	14 47.4	54 10.1	I. S.
18	12 34.97	2.063	6 28 0.29	134.02	21 57 20.6	+ 74.5	66.41	14 50.8	54 22.5	II. S.
19	13 24.84	2.085	7 21 56.11	135.32	21 54 16.2	− 90.8	66 78	14 55.7	54 40.6	II. S.
20	14 14.83	2.076	8 16 0.81	134.80	20 44 55.0	−255.0	66.70	15 1.9	55 3.4	II. S.
21	15 4.34	2.046	9 9 36.07	132.99	18 31 35.6	−408.8	66.30	15 9.5	55 31.1	II. S.
22	15 53.01	2.009	10 2 20.67	130.74	+15 20 14.9	−544.1	65.79	15 18.5	56 4.1	II. S.
23	16 40.87	1.982	10 54 16.47	129.06	11 19 23.5	−655.8	65.41	15 28.9	56 42.3	II. S.
24	17 28.32	1.978	11 45 47.95	128.85	6 39 17.2	−739.8	65.39	15 40.6	57 25.4	II. S.
25	18 16.08	2.009	12 37 37.93	130.71	+ 1 31 44.2	−792.1	65.88	15 53.3	58 12.1	II. S.
26	19 5.07	2.082	13 30 42.22	135.02	− 3 49 20.2	−806.3	66.99	16 6.4	59 0.1	II. S.
27	19 56.32	2.196	14 26 2.03	141.97	− 9 6 51.1	−772.7	68.69	16 18.8	59 45.7	II. S.
28	20 50.74	2.343	15 24 32.53	150.80	−13 59 36.5	−680.6	70.81	16 29.3	60 24.2	II. S.
29	21 48.82	2.496	16 26 43.48	159.99	−18 2 36.0	−523.3	72 96	16 36.3	60 50.1	II. S.
30	22 50.22	2.610	17 32 13.94	166.93	−20 50 4.2	−305.5	74.37	16 38.8	60 59.1	II. S.
31	23 53.47	2.642	18 39 35.93	168.86	−22 1 58.3	− 50.8	74.98	16 35.9	60 48.6	

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Jan. 0	23 20.0	18 3 6.63	−24 19 45.3	6.3	2.4	0.17	Feb. 16	1 20.9	23 5 37.10	−4 42 5.8	9.3	3.5	0.22
1	23 22.9	18 9 55.65	24 24 42.3	6.3	2.4	0.17	17	1 20.1	23 8 48.66	4 5 24.6	9.6	3.6	0.23
2	23 25.8	18 16 46.69	24 28 20.7	6.3	2.4	0.17	18	1 18.9	23 11 30.32	3 31 37.5	9.9	3.7	0.24
3	23 28.7	18 23 39.65	24 30 39.5	6.3	2.4	0.17	19	1 17.1	23 13 40.21	3 1 8.4	10.2	3.8	0.25
4	23 31.7	18 30 34.41	24 31 37.5	6.2	2.4	0.17	20	1 14.8	23 15 16.86	2 34 20.2	10.5	3.9	0.26
5	23 34.7	18 37 30.85	−24 31 13.4	6.2	2.4	0.17	21	1 11.9	23 16 19.12	−2 11 33.2	10.9	4.1	0.27
6	23 37.7	18 44 28.87	24 29 26.1	6.2	2.3	0.17	22	1 8.4	23 16 46.33	1 53 5.6	11.2	4.2	0.27
7	23 40.7	18 51 28.36	24 26 14.4	6.2	2.3	0.17	23	1 4.3	23 16 38.43	1 39 12.5	11.6	4.3	0.28
8	23 43.8	18 58 29.22	24 21 37.3	6.2	2.3	0.17	24	0 59.7	23 15 55.94	1 30 5.1	11.9	4.5	0.29
9	23 46.8	19 5 31.32	24 15 33.8	6.2	2.3	0.17	25	0 54.6	23 14 40.10	1 25 49.3	12.3	4.6	0.30
10	23 49.9	19 12 34.56	−24 8 2.9	6.2	2.3	0.17	26	0 48.9	23 12 52.89	−1 26 26.3	12.6	4.7	0.31
11	23 53.1	19 19 38.82	23 59 3.7	6.2	2.3	0.17	27	0 42.6	23 10 36.98	1 31 50.8	12.8	4.8	0.32
12	23 56.2	19 26 44.01	23 48 35.4	6.2	2.3	0.17	28	0 35.9	23 7 55.79	1 41 51.5	13.1	4.9	0.32
13	23 59.3	19 33 49.99	23 36 37.1	6.2	2.3	0.17	29	0 28.9	23 4 53.37	1 56 10.7	13.4	5.1	0.33
15	0 2.5	19 40 56.64	23 23 8.0	6.2	2.3	0.17	Mar. 1	0 21.7	23 1 34.27	2 14 24.5	13.7	5.2	0.34
16	0 5.7	19 48 3.83	−23 8 7.4	6.2	2.3	0.17	2	0 14.3	22 58 3.42	−2 36 3.7	13.9	5.2	0.34
17	0 8.8	19 55 11.45	22 51 34.7	6.2	2.3	0.17	3	0 6.8	22 54 25.92	3 0 34.7	14.0	5.3	0.35
18	0 12.0	20 2 19.36	22 33 29.2	6.2	2.3	0.17	3	23 59.3	22 50 46.94	3 27 20.9	14.1	5.3	0.35
19	0 15.2	20 9 27.43	22 13 50.7	6.3	2.4	0.17	4	23 51.8	22 47 11.40	3 55 44.0	14.2	5.4	0.36
20	0 18.4	20 16 35.53	21 52 38.7	6.3	2.4	0.17	5	23 44.4	22 43 43.89	4 25 6.5	14.3	5.4	0.36
21	0 21.6	20 23 43.50	−21 29 52.8	6.3	2.4	0.17	6	23 37.2	22 40 28.52	−4 54 51.7	14.3	5.4	0.36
22	0 24.7	20 30 51.19	21 5 32.8	6.3	2.4	0.17	7	23 30.3	22 37 28.76	5 24 26.1	14.2	5.3	0.37
23	0 27.9	20 37 58.42	20 39 38.8	6.4	2.4	0.17	8	23 23.7	22 34 47.55	5 53 19.6	14.1	5.3	0.36
24	0 31.1	20 45 5.00	20 12 11.0	6.4	2.4	0.17	9	23 17.4	22 32 27.14	6 21 5.6	14.0	5.3	0.36
25	0 34.2	20 52 10.75	19 43 9.5	6.4	2.4	0.17	10	23 11.5	22 30 29.02	6 47 23.5	13.9	5.2	0.35
26	0 37.4	20 59 15.41	−19 12 35.2	6.5	2.4	0.17	11	23 6.0	22 28 54.27	−7 11 55.9	13.7	5.2	0.35
27	0 40.5	21 6 18.71	18 40 28.9	6.5	2.5	0.18	12	23 0.8	22 27 43.42	7 34 29.0	13.5	5.1	0.34
28	0 43.5	21 13 20.38	18 6 51.8	6.6	2.5	0.18	13	22 56.1	22 26 56.55	7 54 53.4	13.3	5.0	0.33
29	0 46.6	21 20 20.08	17 31 45.4	6.6	2.5	0.18	14	22 51.8	22 26 33.41	8 13 2.3	13.1	5.0	0.33
30	0 49.6	21 27 17.42	16 55 12.2	6.7	2.5	0.18	15	22 47.9	22 26 33.46	8 28 51.6	12 9	4.9	0.32
31	0 52.6	21 34 11.96	−16 17 14.8	6.8	2.5	0.18	16	22 44.4	22 26 55.94	−8 42 19 5	12.7	4.8	0.32
Feb. 1	0 55.5	21 41 3.16	15 37 56.1	6.9	2.6	0.18	17	22 41.2	22 27 39.94	8 53 25.6	12.4	4.7	0.31
2	0 58.3	21 47 50.43	14 57 20.6	7.0	2.6	0.18	18	22 38.3	22 28 44.48	9 2 10.7	12.2	4.6	0.31
3	1 1.0	21 54 33.14	14 15 33.6	7.0	2.6	0.19	19	22 35.8	22 30 8.50	9 8 36.8	12.0	4.6	0.30
4	1 3.7	22 1 10.45	13 32 40 6	7.1	2.7	0.19	20	22 33.5	22 31 50.93	9 12 46.4	11.8	4.5	0.30
5	1 6.3	22 7 41.42	−12 48 48.8	7.2	2.7	0.19	21	22 31.5	22 33 50.69	−9 14 42.7	11.6	4.4	0.29
6	1 8.8	22 14 5.01	12 4 7.1	7.4	2.8	0.19	22	22 29.8	22 36 6.71	9 14 28.8	11.4	4.3	0.29
7	1 11.1	22 20 20.06	11 18 45.5	7.5	2.8	0.20	23	22 28.5	22 38 37.97	9 12 8.2	11.2	4.2	0.28
8	1 13.2	22 26 25.20	10 32 55.6	7.7	2.9	0.20	24	22 27.4	22 41 23.50	9 7 44.5	11.0	4.2	0.28
9	1 15.2	22 32 18.93	9 46 50.7	7.8	2.9	0.20	25	22 26.4	22 44 22.36	9 1 21.4	10.8	4.1	0.27
10	1 16.9	22 37 59.57	− 9 0 45.9	8.0	3.0	0.20	26	22 25.6	22 47 33.69	−8 53 2.5	10.6	4.0	0.27
11	1 18.4	22 43 25.27	8 14 58.1	8.2	3.1	0.21	27	22 25.0	22 50 56.69	8 42 51.1	10.4	3.9	0.26
12	1 19.6	22 48 34.09	7 29 46.2	8.4	3.1	0.21	28	22 24.6	22 54 30.61	8 30 50.5	10.3	3.8	0.26
13	1 20.5	22 53 23.91	6 45 30.5	8.6	3.2	0.21	29	22 24.5	22 58 14.75	8 17 4.0	10.1	3.8	0.25
14	1 21.0	22 57 52.53	6 2 32.9	8.8	3.3	0.22	30	22 24.4	23 2 8.46	8 1 34.8	9.9	3.7	0.25
15	1 21.2	23 1 57.68	− 5 21 16.6	9.0	3.4	0.22	31	22 24.5	23 6 11.17	−7 44 25.8	9.7	3.7	0.25
16	1 20.9	23 5 37.10	− 4 42 5.8	9.3	3.5	0.23	32	22 24.7	23 10 22.36	−7 25 39.8	9.6	3.6	0.24

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi diam.	S.T. of Sem. Pass Mer.	Date	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Apr. 1	22 24.7	23 10 22.36	− 7 25 39.8	9.6	3.6	0.24	May 18	0 34.2	4 21 29.69	+22 54 22.9	7.0	2.6	0.19
2	22 25.1	23 14 41.54	7 5 19.5	9.4	3.6	0.24	19	0 39.1	4 30 23.64	23 22 13.4	7.1	2.7	0.19
3	22 25.6	23 19 8.28	6 43 27.4	9.3	3.5	0.23	20	0 43.9	4 39 13.34	23 47 25.5	7.2	2.7	0.19
4	22 26.2	23 23 42.20	6 20 6.1	9.2	3.5	0.23	21	0 48.7	4 47 57.57	24 9 57.1	7.3	2.7	0.19
5	22 27.0	23 28 22.98	5 55 18.1	9.0	3.4	0.23	22	0 53.4	4 56 35.18	24 29 47.7	7.4	2.8	0.20
6	22 27.8	23 33 10.33	− 5 29 5.6	8.9	3.4	0.22	23	0 58.0	5 5 5.10	+24 46 58.4	7.5	2.8	0.20
7	22 28.8	23 38 3.98	5 1 30.8	8.8	3.3	0.22	24	1 2.4	5 13 26.34	25 1 31.8	7.6	2.8	0.21
8	22 29.8	23 43 3.69	4 32 35.8	8.6	3.3	0.21	25	1 6.6	5 21 38.04	25 13 31.4	7.7	2.9	0.21
9	22 30.9	23 48 9.31	4 2 22.5	8.5	3.2	0.21	26	1 10.7	5 29 39.45	25 23 1.5	7.8	2.9	0.21
10	22 32.2	23 53 20.70	3 30 52.9	8.4	3.2	0.21	27	1 14.6	5 37 29.87	25 30 7.2	8.0	3.0	0.22
11	22 33.6	23 58 37.74	− 2 58 9.0	8.3	3.1	0.21	28	1 18.3	5 45 8.68	+25 34 54.3	8.1	3.1	0.22
12	22 35.0	0 4 0.35	2 24 12.9	8.2	3.1	0.20	29	1 21.8	5 52 35.35	25 37 28.9	8.2	3.1	0.23
13	22 36.5	0 9 28.50	1 49 6.5	8.1	3.0	0.20	30	1 25.0	5 59 49.44	25 37 57.6	8.4	3.2	0.23
14	22 38.1	0 15 2.17	1 12 51.4	8.0	3.0	0.20	31	1 28.0	6 6 50.51	25 36 26.9	8.6	3.2	0.23
15	22 39.8	0 20 41.37	− 0 35 29.4	7.9	3.0	0.20	June 1	1 30.9	6 13 38.19	25 33 3.5	8.7	3.3	0.24
16	22 41.6	0 26 26.15	+ 0 2 57.5	7.8	2 9	0.20	2	1 33.6	6 20 12.15	+25 27 54.4	8.9	3.4	0.24
17	22 43.5	0 32 16.59	0 42 27.5	7.7	2.9	0.19	3	1 36.0	6 26 32.08	25 21 6.4	9.1	3.4	0.25
18	22 45.5	0 38 12.78	1 22 58.5	7.6	2.9	0.19	4	1 38.1	6 32 37.6	25 12 46.3	9.2	3.5	0.25
19	22 47.6	0 44 14.84	2 4 28.4	7.5	2.8	0.19	5	1 40.0	6 38 28.72	25 3 0.8	9.4	3.5	0.26
20	22 49.8	0 50 22.92	2 46 55.1	7.5	2.8	0.19	6	1 41.6	6 44 4.88	24 51 56.7	9.6	3.6	0.26
21	22 52.1	0 56 37.18	+ 3 30 16.3	7.4	2.8	0.19	7	1 43.0	6 49 25.96	+24 39 40.5	9.8	3.7	0.27
22	22 54.5	1 2 57.83	4 14 29.6	7.3	2.8	0.18	8	1 44.2	6 54 31.66	24 26 18.7	10.0	3.8	0.28
23	22 56.9	1 9 25.09	4 59 32.4	7.3	2.7	0.18	9	1 45.1	6 59 21.74	24 11 57.9	10.2	3.8	0.28
24	22 59.6	1 15 59.17	5 45 21.8	7.2	2.7	0.18	10	1 45.7	7 3 55.90	23 56 44.4	10.5	3.9	0.29
25	23 2.3	1 22 40.29	6 31 54.5	7.1	2.7	0.18	11	1 46.1	7 8 13.84	23 40 44.5	10.7	4.0	0.29
26	23 5.2	1 29 28.72	+ 7 19 6.8	7.1	2.7	0.18	12	1 46.2	7 12 15.30	+23 24 4.3	11.0	4.1	0.30
27	23 8.2	1 36 24.69	8 6 54.8	7.0	2.6	0.18	13	1 46.0	7 15 59.98	23 6 50.2	11.2	4.2	0.31
28	23 11.3	1 43 28.45	8 55 14.3	7.0	2.6	0.18	14	1 45.5	7 19 27.58	22 49 8.1	11.4	4.3	0.31
29	23 14.5	1 50 40.27	9 44 0.1	6.9	2.6	0.18	15	1 44.7	7 22 37.76	22 31 4.2	11.6	4.4	0.32
30	23 17.9	1 58 0.33	10 33 6.7	6.9	2.6	0.18	16	1 43.7	7 25 30.19	22 12 44.4	11.9	4.5	0.32
May 1	23 21.5	2 5 28.82	+11 22 27.9	6.8	2.6	0.18	17	1 42.3	7 28 4.59	+21 54 15.0	12.1	4.6	0.33
2	23 25.1	2 13 5.90	12 11 56.6	6.8	2.5	0.18	18	1 40.6	7 30 20.67	21 35 41.9	12.4	4.7	0.34
3	23 28.9	2 20 51.65	13 1 24.9	6.8	2.5	0.17	19	1 38.7	7 32 18.09	21 17 11.0	12.6	4.7	0.34
4	23 32.9	2 28 46.11	13 50 44.4	6.7	2.5	0.17	20	1 36.4	7 33 56.60	20 58 48.3	12.9	4.8	0.35
5	23 37.0	2 36 49.22	14 39 45.5	6.7	2.5	0.17	21	1 33.7	7 35 15.98	20 40 39.8	13.1	4.9	0.35
6	23 41.2	2 45 0.79	+15 28 17.9	6.7	2.5	0.17	22	1 30.7	7 36 16.06	+20 22 51.6	13.4	5.0	0.36
7	23 45.6	2 53 20.52	16 16 10.6	6.7	2.5	0.17	23	1 27.5	7 36 56.70	20 5 29.5	13.6	5.1	0.36
8	23 50.1	3 1 48.05	17 3 11.9	6.7	2.5	0.17	24	1 24.0	7 37 17.91	19 48 39.3	13.9	5.2	0.37
9	23 54.7	3 10 22.82	17 49 9.3	6.7	2.5	0.18	25	1 20.1	7 37 19.74	19 32 26.8	14.1	5.3	0.37
10	23 59.4	3 19 4.11	18 33 50.3	6.7	2.5	0.18	26	1 15.9	7 37 2.43	19 16 57.4	14.3	5.4	0.38
12	0 4.2	3 27 51.07	+19 17 2.2	6.7	2.5	0.18	27	1 11.3	7 36 26.31	+19 2 16.6	14.5	5.5	0.38
13	0 9.1	3 36 42.72	19 58 32.8	6.7	2.5	0.18	28	1 6.4	7 35 31.92	18 48 29.7	14.7	5.5	0.39
14	0 14.1	3 45 37.98	20 38 10.1	6.8	2.6	0.18	29	1 1.3	7 34 19.97	18 35 41.7	14.9	5.6	0.39
15	0 19.1	3 54 35.61	21 15 43.0	6.8	2.6	0.18	30	0 55.9	7 32 51.37	18 23 57.2	15.1	5.7	0.39
16	0 24.2	4 3 34.33	21 51 1.4	6.9	2.6	0.18	31	0 50.3	7 31 7.25	18 13 20.4	15.2	5.7	0.39
17	0 29.2	4 12 32.81	+22 23 57.1	7.0	2.6	0.19	32	0 44.4	7 29 8.98	+18 3 55.3	15.3	5.8	0.40
18	0 34.2	4 21 29.69	+22 54 22.9	7.0	2.6	0.19	33	0 38.3	7 26 58.21	+17 55 45.2	15.4	5.9	0.40

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T.of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T.of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
July 1	0 50.3	7 31 7.25	+18 13 20.4	15.2	5.7	0.39	Aug. 15	23 35.8	9 17 49.24	+17 22 38.8	6.9	2.6	0.18
2	0 44.4	7 29 8.98	18 3 55.3	15.3	5.8	0.40	16	23 40.0	9 25 57.11	16 49 24.5	6.8	2.6	0.17
3	0 38.3	7 26 58.21	17 55 45.2	15.4	5.9	0.40	17	23 44.1	9 34 1.92	16 14 13 4	6.7	2.5	0.17
4	0 31.9	7 24 36.74	17 48 53.0	15.5	5.9	0.40	18	23 48.1	9 42 2.59	15 37 15.4	6.7	2.5	0.17
5	0 25.5	7 22 6.65	17 43 20.9	15.5	5.9	0.40	19	23 52.1	9 49 58.25	14 58 41.3	6.6	2.5	0.17
6	0 19.0	7 19 30.18	+17 39 10.3	15.6	5.8	0.40	20	23 56.0	9 57 48.21	+14 18 41.2	6.6	2.5	0.17
7	0 12.4	7 16 49.78	17 36 22.2	15.5	5.8	0.40	21	23 59.8	10 5 31.96	13 37 24.8	6.5	2.5	0.17
8	0 5.8	7 14 7.99	17 34 56.7	15.5	5.8	0.40	23	0 3.5	10 13 9.09	12 55 1.5	6.5	2.5	0.17
8	23 59.2	7 11 27.42	17 34 53.2	15.4	5.8	0.40	24	0 7.0	10 20 39.30	12 11 40.2	6.5	2.4	0.17
9	23 52.6	7 8 50.73	17 36 10.5	15.3	5.8	0.39	25	0 10.4	10 28 2.50	11 27 29.3	6.5	2.4	0.17
10	23 46.2	7 6 20.56	+17 38 46.7	15.2	5.7	0.39	26	0 13.8	10 35 18.63	+10 42 36.4	6.4	2.4	0.16
11	23 40.0	7 3 59.49	17 42 38.6	15.0	5.7	0.39	27	0 17.0	10 42 27.68	9 57 9.0	6.4	2.4	0.16
12	23 33.9	7 1 49.97	17 47 42.7	14.8	5.6	0.38	28	0 20.1	10 49 29.73	9 11 13.3	6.4	2.4	0.16
13	23 28.0	6 59 54.31	17 53 55.0	14.5	5.5	0.38	29	0 23.0	10 56 24.90	8 24 55.3	6.4	2.4	0.16
14	23 22.4	6 58 14.65	18 1 10.8	14.3	5.4	0.37	30	0 25.9	11 3 13.38	7 38 20.6	6.4	2.4	0.16
15	23 17.1	6 56 52.87	+18 9 24.5	14.0	5.3	0.37	31	0 28.6	11 9 55.35	+ 6 51 34.3	6.4	2.4	0.16
16	23 12.2	6 55 50.67	18 18 30.2	13.7	5.2	0.36	Sept. 1	0 31.3	11 16 31.03	6 4 40.7	6 4	2.4	0.16
17	23 7.5	6 55 9.55	18 28 21.1	13.4	5.1	0.35	2	0 33.8	11 23 0.65	5 17 44.2	6.4	2.4	0.16
18	23 3.3	6 54 50.77	18 38 50.2	13.1	5.0	0.34	3	0 36.2	11 29 24.42	4 30 48.4	6.5	2.4	0.16
19	22 59.5	6 54 55.35	18 49 49.9	12.8	4.9	0.34	4	0 38.6	11 35 42.59	3 43 56.9	6.5	2.4	0.16
20	22 56.0	6 55 24.11	+19 1 12.4	12.5	4.8	0.33	5	0 40.9	11 41 55.40	+ 2 57 12.7	6.5	2.5	0.16
21	22 53.0	6 56 17.73	19 12 49.1	12.2	4.6	0.32	6	0 43.1	11 48 3.07	2 10 38.7	6.5	2.5	0.16
22	22 50.4	6 57 36.67	19 24 30.9	11.9	4.5	0.32	7	0 45.2	11 54 5.83	1 24 17.7	6.5	2.5	0.16
23	22 48.2	6 59 21.27	19 36 8.5	11.5	4.4	0.31	8	0 47.2	12 0 3.90	+ 0 38 12.1	6.5	2.5	0.16
24	22 46.3	7 1 31.71	19 47 32.5	11.2	4.3	0.30	9	0 49.1	12 5 57.49	− 0 7 35.8	6.6	2.5	0.16
25	22 45.0	7 4 8.05	+19 58 32.6	10.9	4.2	0.30	10	0 51.0	12 11 46.80	− 0 53 3.8	6.6	2.5	0.17
26	22 44.1	7 7 10.24	20 8 58.3	10.6	4.0	0.29	11	0 52.8	12 17 32.02	1 38 10.2	6.6	2.5	0.17
27	22 43.6	7 10 38.08	20 18 38.6	10.3	3.9	0.28	12	0 54.6	12 23 13.33	2 22 53.2	6.7	2.5	0.17
28	22 43.6	7 14 31.28	20 27 22.2	10.0	3.8	0.27	13	0 56.3	12 28 50.89	3 7 10.8	6.7	2.5	0.17
29	22 44.0	7 18 49.43	20 34 58.4	9.8	3.7	0.26	14	0 57.9	12 34 24.85	3 51 1.0	6.8	2.5	0.17
30	22 44.8	7 23 32.01	+20 41 15.4	9.5	3.6	0.26	15	0 59.4	12 39 55.34	− 4 34 22.2	6.8	2.6	0.17
31	22 46.0	7 28 38.37	20 46 1.6	9.3	3.5	0.25	16	1 0.9	12 45 22.48	5 17 13.0	6.9	2.6	0.17
Aug. 1	22 47.4	7 34 7.69	20 49 5.7	9.0	3.4	0.24	17	1 2.4	12 50 46.37	5 59 31.8	6.9	2.6	0.17
2	22 49.3	7 39 59.00	20 50 16.6	8.8	3.3	0.23	18	1 3.8	12 56 7.10	6 41 17.1	7.0	2.6	0.17
3	22 51.6	7 46 11.17	20 49 23.7	8.6	3.3	0.23	19	1 5.1	13 1 24.74	7 22 27.2	7.0	2.6	0.17
4	22 54.2	7 52 42.95	+20 46 17.2	8.4	3.2	0.22	20	1 6.4	13 6 39.34	− 8 3 0.6	7.1	2.7	0.18
5	22 57.0	7 59 32.90	20 40 48.1	8.2	3.1	0.22	21	1 7.6	13 11 50.93	8 42 55.9	7.1	2.7	0.18
6	23 0.2	8 6 39.40	20 32 49.0	8.0	3.0	0.21	22	1 8.8	13 16 59.51	9 22 11.4	7.2	2.7	0.18
7	23 3.6	8 14 0.66	20 22 14.3	7.8	3.0	0.21	23	1 9.9	13 22 5.06	10 0 45.4	7.3	2.7	0.18
8	23 7.2	8 21 34.83	20 8 59.5	7.6	2.9	0.21	24	1 11.0	13 27 7.54	10 38 36.2	7.3	2.8	0.18
9	23 11.0	8 29 19.92	+19 53 2.5	7.5	2.9	0.20	25	1 12.1	13 32 6 87	−11 15 42.0	7.4	2.8	0.19
10	23 15.0	8 37 13.93	19 34 23.2	7.3	2.8	0.20	26	1 13.1	13 37 2.95	11 52 1.0	7.5	2.8	0.19
11	23 19.1	8 45 14.83	19 13 3.4	7.2	2.8	0.19	27	1 14.1	13 41 55.65	12 27 31.4	7.6	2.8	0.19
12	23 23.2	8 53 20.64	18 49 6.6	7.1	2.7	0.19	28	1 15.0	13 46 44.80	13 2 11.1	7.7	2.9	0.19
13	23 27.4	9 1 29.47	18 22 38.8	7.0	2.7	0.19	29	1 15.8	13 51 30.17	13 35 57.8	7.8	2.9	0.19
14	23 31.6	9 9 39.55	+17 53 46.9	6.9	2.6	0.18	30	1 16.5	13 56 11.49	−14 8 49.1	7.9	3.0	0.20
15	23 35.8	9 17 49.24	+17 22 38.8	6.9	2.6	0.18	31	1 17.1	14 0 48.45	−14 40 42.5	8 0	3.0	0.20

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s
Oct. 1	1 17.1	14 0 48.45	−14 40 42.5	8.0	3.0	0.20
2	1 17.7	14 5 20.68	15 11 35.3	8.1	3.0	0.20
3	1 18.3	14 9 47.76	15 41 24.4	8.2	3.1	0.20
4	1 18.7	14 14 9.17	16 10 6.7	8.3	3.1	0.21
5	1 18.9	14 18 24.35	16 37 38.6	8.5	3.2	0.21
6	1 19.1	14 22 32.65	−17 3 56.3	8.6	3.2	0.22
7	1 19.2	14 26 33.30	17 28 55.7	8.7	3.3	0.22
8	1 19.1	14 30 25.47	17 52 32.0	8.8	3.3	0.23
9	1 18.9	14 34 8.17	18 14 39.8	9.0	3.4	0.23
10	1 18.5	14 37 40.33	18 35 13.5	9.1	3.5	0.24
11	1 17.9	14 41 0.75	−18 54 6.9	9.3	3.5	0.24
12	1 17.1	14 44 8.07	19 11 13.1	9.5	3.6	0.25
13	1 16.1	14 47 0.80	19 26 23.8	9.7	3.7	0.25
14	1 14.7	14 49 37.29	19 39 30.5	9.9	3.7	0.26
15	1 13.1	14 51 55.75	19 50 23.5	10.1	3.8	0.27
16	1 11.2	14 53 54.26	−19 58 52.0	10.3	3.9	0.27
17	1 8.9	14 55 30.75	20 4 44.0	10.6	4.0	0.28
18	1 6.1	14 56 43.10	20 7 46.9	10.8	4.1	0.28
19	1 2.9	14 57 29.09	20 7 46.6	11.0	4.2	0.29
20	0 59.3	14 57 46.57	20 4 28.2	11.3	4.3	0.30
21	0 55.2	14 57 33.52	−19 57 36.5	11.5	4.4	0.30
22	0 50.5	14 56 48.19	19 46 56.5	11.8	4.5	0.31
23	0 45.2	14 55 29.23	19 32 14.1	12.0	4.6	0.31
24	0 39.4	14 53 35 96	19 13 18.0	12.3	4.7	0.32
25	0 33.0	14 51 8.55	18 50 0.5	12.5	4.7	0.33
26	0 26.1	14 48 8.23	−18 22 20.2	12.7	4.8	0.33
27	0 18.7	14 44 37.54	17 50 25.0	12.9	4.9	0.34
28	0 10.8	14 40 40.47	17 14 33.2	13.0	4.9	0.34
29	0 2.5	14 36 22.44	16 35 16.1	13.1	4.9	0.34
29	23 54.1	14 31 50.33	15 53 17.1	13.1	5.0	0.35
30	23 45.6	14 27 12.01	−15 9 33.2	13.1	4.9	0.34
31	23 37.1	14 22 36.09	14 25 12.1	13.0	4.9	0.34
Nov. 1	23 28.7	14 18 11.37	13 41 27.6	13.0	4.8	0.33
2	23 20.6	14 14 6.18	12 59 34.2	12.8	4.8	0.33
3	23 13.1	14 10 27.97	12 20 42.3	12.6	4.7	0.32
4	23 6.1	14 7 22.82	−11 45 52.8	12.3	4.6	0.32
5	22 59.7	14 4 55.21	11 15 53.4	12.0	4.5	0.31
6	22 54.0	14 3 8.05	10 51 16.8	11.7	4.4	0.30
7	22 49.0	14 2 2.62	10 32 21.2	11.4	4.3	0.29
8	22 44.7	14 1 38.91	10 19 10.8	11.0	4.2	0.28
9	22 41.0	14 1 55.72	−10 11 38.4	10.7	4.0	0.27
10	22 38.0	14 2 51.01	10 9 28.4	10.4	3.9	0.26
11	22 35.5	14 4 22.26	10 12 18.2	10.1	3.8	0.25
12	22 33.6	14 6 26.58	10 19 41.2	9.8	3.7	0.25
13	22 32.3	14 9 0.93	10 31 8.8	9.5	3.6	0.24
14	22 31.4	14 12 2.28	−10 46 12.3	9.2	3.5	0.23
15	22 30.9	14 15 27.75	−11 4 23.4	9.0	3.4	0.23

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s
Nov. 15	22 30.9	14 15 27.75	−11 4 23.4	9.0	3.4	0.23
16	22 30.7	14 19 14.58	11 25 14.9	8.7	3.3	0.23
17	22 30.8	14 23 20.32	11 48 21.9	8.5	3.2	0.22
18	22 31.3	14 27 42.71	12 13 21.0	8.3	3.1	0.22
19	22 32.0	14 32 19.72	12 39 51.4	8.2	3.1	0.21
20	22 32.9	14 37 9.60	−13 7 34.3	8.0	3.0	0.21
21	22 34.0	14 42 10.80	13 36 13.0	7.8	3.0	0.20
22	22 35.2	14 47 21.98	14 5 32.8	7.7	2.9	0.20
23	22 36.6	14 52 42.00	14 35 20.4	7.5	2.9	0.20
24	22 38.1	14 58 9.85	15 5 24.2	7.4	2.8	0.19
25	22 39.8	15 3 44.69	−15 35 34.5	7.3	2.8	0.19
26	22 41.5	15 9 25.79	16 5 42.1	7.2	2.8	0.19
27	22 43.3	15 15 12.50	16 35 39.1	7.1	2.7	0.19
28	22 45.2	15 21 4.29	17 5 18.5	7.0	2.7	0.18
29	22 47.2	15 27 0.75	17 34 34.2	6.9	2.6	0.18
30	22 49.3	15 33 1.50	−18 3 20.9	6.9	2.6	0.18
Dec. 1	22 51.4	15 39 6.21	18 31 33.6	6.8	2.6	0.18
2	22 53.6	15 45 14.61	18 59 8.2	6.8	2.6	0.18
3	22 55.9	15 51 26.46	19 26 0.6	6.7	2.5	0.18
4	22 58.2	15 57 41.57	19 52 7.6	6.6	2.5	0.17
5	23 0.5	16 3 59.78	−20 17 25.8	6.6	2.5	0.17
6	23 2.9	16 10 20.95	20 41 52.2	6.5	2.5	0.17
7	23 5.3	16 16 44.95	21 5 24.5	6.5	2.5	0.17
8	23 7.8	16 23 11.69	21 28 0.1	6.5	2.4	0.17
9	23 10.4	16 29 41.06	21 49 36.7	6.4	2.4	0.17
10	23 12.9	16 36 12.99	−22 10 12.3	6.4	2.4	0.17
11	23 15.6	16 42 47.41	22 29 45.0	6.3	2.4	0.17
12	23 18.3	16 49 24.23	22 48 12.7	6.3	2.4	0.17
13	23 21.0	16 56 3.41	23 5 33.6	6.3	2.4	0.17
14	23 23.7	17 2 44.88	23 21 46.2	6.2	2.4	0.17
15	23 26.5	17 9 28.58	−23 36 48.8	6.2	2.3	0.17
16	23 29.3	17 16 14.46	23 50 39.7	6.2	2.3	0.17
17	23 32.1	17 23 2.46	24 3 17.6	6.2	2.3	0.17
18	23 35.0	17 29 52.52	24 14 40.9	6.2	2.3	0.17
19	23 37.9	17 36 44.56	24 24 48.0	6.2	2.3	0.17
20	23 40.9	17 43 38.52	−24 33 37.6	6.1	2.3	0.17
21	23 43.9	17 50 34.31	24 41 8.5	6.1	2.3	0.17
22	23 46.9	17 57 31.87	24 47 19.3	6.1	2.3	0.17
23	23 49.9	18 4 31.12	24 52 8.6	6.1	2.3	0.17
24	23 53.0	18 11 31.95	24 55 35.1	6.1	2.3	0.17
25	23 56.1	18 18 34.29	−24 57 37.6	6.1	2.3	0.17
26	23 59.2	18 25 38.01	24 58 14.8	6.1	2.3	0.17
28	0 2.4	18 32 42.97	24 57 25.6	6.1	2.3	0.17
29	0 5.5	18 39 49.10	24 55 8.9	6.2	2.3	0.17
30	0 8.7	18 46 56.27	24 51 23.5	6.2	2.3	0.17
31	0 11.8	18 54 4.33	−24 46 8.4	6.2	2.3	0.17
32	0 15.0	19 1 13.10	−24 39 22.5	6.2	2.3	0.17

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Jan. 0	20 55.5	15 38 7.83	−16 41 36.8	9.8	9.4	0.66	Feb. 15	21 46.0	19 30 5.90	−21 10 24.6	7.3	7.0	0.50
1	20 56.2	15 42 47.82	16 58 24.7	9.7	9.3	0.65	16	21 47.2	19 35 16.52	21 2 21.0	7.2	7.0	0.50
2	20 56.9	15 47 29.26	17 14 53.2	9.6	9.3	0.65	17	21 48.4	19 40 26.66	20 53 40.4	7.2	7.0	0.50
3	20 57.7	15 52 12.12	17 31 1.5	9.6	9.2	0.65	18	21 49.6	19 45 36.30	20 44 23.1	7.1	6.9	0.49
4	20 58.5	15 56 56.39	17 46 48.7	9.5	9.2	0.64	19	21 50.8	19 50 45.38	20 34 29.6	7.1	6.9	0.49
5	20 59.3	16 1 42.05	−18 2 13.9	9.4	9.1	0.64	20	21 52.0	19 55 53.87	−20 24 0.0	7.1	6.9	0.49
6	21 0.2	16 6 29.09	18 17 16.4	9.3	9.0	0.63	21	21 53.2	20 1 1.73	20 12 54.6	7.0	6.8	0.48
7	21 1.0	16 11 17.49	18 31 55.4	9.2	9.0	0.63	22	21 54.4	20 6 8.93	20 1 14.0	7.0	6.8	0.48
8	21 1.9	16 16 7.22	18 46 10.0	9.2	8.9	0.63	23	21 55.6	20 11 15.43	19 48 58.5	7.0	6 8	0.48
9	21 2.8	16 20 58.25	18 59 59.5	9.1	8.8	0.62	24	21 56.7	20 16 21.20	19 36 8.4	6.9	6.7	0.47
10	21 3.7	16 25 50.57	−19 13 23.1	9.0	8.7	0.62	25	21 57.8	20 21 26.23	−19 22 44.3	6.9	6.7	0.47
11	21 4.6	16 30 44.14	19 26 20.0	9.0	8.7	0.61	26	21 58.9	20 26 30.49	19 8 46.4	6.9	6.7	0.47
12	21 5.6	16 35 38.93	19 38 49.6	8.9	8.6	0.61	27	22 0.0	20 31 33.93	18 54 15.2	6.8	6.6	0.47
13	21 6.6	16 40 34.91	19 50 51.2	8.8	8.5	0.61	28	22 1.1	20 36 36.54	18 39 11.3	6.8	6.6	0.46
14	21 7.6	16 45 32.05	20 2 24.0	8.8	8.5	0.60	29	22 2.2	20 41 38.31	18 23 35.2	6.8	6.6	0.46
15	21 8.6	16 50 30.32	−20 13 27.3	8.7	8.4	0.60	Mar. 1	22 3.3	20 46 39.23	−18 7 27.4	6.8	6.5	0.46
16	21 9.7	16 55 29.68	20 24 0.4	8.7	8.4	0.60	2	22 4.3	20 51 39.27	17 50 48.3	6.7	6.5	0.46
17	21 10.7	17 0 30.08	20 34 2.8	8.6	8.3	0.59	3	22 5.4	20 56 38.40	17 33 38.7	6.7	6.5	0.45
18	21 11.8	17 5 31.50	20 43 33.9	8.5	8.3	0.59	4	22 6.4	21 1 36.61	17 15 59.0	6.7	6.4	0.45
19	21 12.9	17 10 33 92	20 52 33.0	8.5	8.2	0.59	5	22 7.4	21 6 33.89	16 57 49.7	6.6	6.4	0.45
20	21 14.0	17 15 37.28	−21 0 59.7	8.4	8.2	0.58	6	22 8.4	21 11 30.24	−16 39 11.5	6.6	6.4	0.44
21	21 15.2	17 20 41.56	21 8 53.4	8.4	8.1	0.58	7	22 9.4	21 16 25.64	16 20 5.0	6.6	6.4	0.44
22	21 16.4	17 25 46.70	21 16 13.6	8.3	8.1	0.58	8	22 10.4	21 21 20.08	16 0 30.8	6.6	6.3	0.44
23	21 17.5	17 30 52.67	21 22 59.8	8.3	8.0	0.57	9	22 11.4	21 26 13.56	15 40 29.5	6.5	6.3	0.44
24	21 18.7	17 35 59.42	21 29 11.5	8.2	7.9	0.57	10	22 12.3	21 31 6.07	15 20 1.9	6.5	6.3	0.43
25	21 19.9	17 41 6.91	−21 34 48.4	8.2	7.9	0.57	11	22 13.2	21 35 57.62	−14 59 8.6	6.5	6.3	0.43
26	21 21.1	17 46 15.11	21 39 50.0	8.1	7.8	0.56	12	22 14.1	21 40 48.20	14 37 50.0	6.4	6.2	0.43
27	21 22.3	17 51 23.97	21 44 15.8	8.1	7.8	0.56	13	22 15.0	21 45 37.82	14 16 7.0	6.4	6.2	0.43
28	21 23.5	17 56 33.43	21 48 5.5	8.0	7.7	0.56	14	22 15.8	21 50 26.48	13 54 0.2	6.4	6.2	0.42
29	21 24.7	18 1 43.44	21 51 18.9	8.0	7.7	0.55	15	22 16.7	21 55 14.19	13 31 30.2	6.4	6.2	0.42
30	21 25.9	18 6 53.96	−21 53 55.6	7.9	7.7	0.55	16	22 17.5	22 0 0.96	−13 8 37.7	6.3	6.1	0.42
31	21 27.1	18 12 4.94	21 55 55.3	7.9	7.6	0.55	17	22 18.3	22 4 46.80	12 45 23.5	6.3	6.1	0.42
Feb. 1	21 28.4	18 17 16.31	21 57 17.9	7.8	7.6	0.54	18	22 19.1	22 9 31.73	12 21 48.1	6.3	6.1	0.42
2	21 29.6	18 22 28.04	21 58 3.1	7.8	7.5	0.54	19	22 19.9	22 14 15.76	11 57 52.4	6.3	6.1	0.41
3	21 30.9	18 27 40.06	21 58 10.6	7.8	7.5	0.54	20	22 20.7	22 18 58.91	11 33 37.0	6.2	6.0	0.41
4	21 32.1	18 32 52.32	−21 57 40.4	7.7	7.4	0.54	21	22 21.4	22 23 41.20	−11 9 2.6	6.2	6.0	0.41
5	21 33.4	18 38 4.74	21 56 32.3	7.7	7.4	0.53	22	22 22.1	22 28 22.66	10 44 9.7	6.2	6.0	0.41
6	21 34.6	18 43 17.27	21 54 46.2	7.6	7.4	0.53	23	22 22.9	22 33 3.31	10 18 59.1	6.2	6.0	0.41
7	21 35.9	18 48 29.86	21 52 22.2	7.6	7.3	0.53	24	22 23.6	22 37 43.17	9 53 31.5	6.2	5.9	0.40
8	21 37.2	18 53 42.46	21 49 20.2	7.5	7.3	0.52	25	22 24.3	22 42 22.27	9 27 47.5	6.1	5.9	0.40
9	21 38.5	18 58 55.00	−21 45 40.0	7.5	7.2	0.52	26	22 25.0	22 47 0.63	− 9 1 47.8	6.1	5.9	0.40
10	21 39.8	19 4 7.42	21 41 21.8	7.5	7.2	0.52	27	22 25.7	22 51 38.29	8 35 33.1	6.1	5.9	0.40
11	21 41.0	19 9 19.67	21 36 25.7	7.4	7.2	0.51	28	22 26.4	22 56 15.27	8 9 4.1	6.1	5.9	0.40
12	21 42.2	19 14 31.70	21 30 51.8	7.4	7.1	0.51	29	22 27.1	23 0 51.61	7 42 21.4	6.1	5.8	0.39
13	21 43.5	19 19 43.45	21 24 40.2	7.3	7.1	0.51	30	22 27.7	23 5 27.33	7 15 25.7	6.0	5.8	0.39
14	21 44.8	19 24 54.86	−21 17 51.1	7.3	7.0	0.51	31	22 28.3	23 10 2.47	− 6 48 17.9	6.0	5.8	0.39
15	21 46.0	19 30 5.90	−21 10 24.6	7.3	7.0	0.50	32	22 28.9	23 14 37.06	− 6 20 58.5	6.0	5.8	0.39

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Apr. 1	22 28.9	23 14 37.06	− 6 20 58.5	6.0	5.8	0.39	May 17	22 58.3	2 45 22.46	+14 44 56.9	5.3	5.2	0.36
2	22 29.5	23 19 11.13	5 53 28.2	6.0	5.8	0.39	18	22 59.1	2 50 11.01	15 8 17.1	5.3	5.2	0.36
3	22 30.2	23 23 44.72	5 25 47.7	6.0	5.8	0.39	19	23 0.0	2 55 0.61	15 31 15.1	5.3	5.1	0.36
4	22 30.8	23 28 17.85	4 57 57.6	5.9	5.7	0.39	20	23 0.9	2 59 51.26	15 53 50.3	5.3	5.1	0.36
5	22 31.4	23 32 50.56	4 29 58.6	5.9	5.7	0.38	21	23 1.8	3 4 42.98	16 16 2.0	5.3	5.1	0.36
6	22 32.0	23 37 22.88	− 4 1 51.6	5.9	5.7	0.38	22	23 2.7	3 9 35.79	+16 37 49.4	5.3	5.1	0.36
7	22 32.6	23 41 54.83	3 33 37.1	5.9	5.7	0.38	23	23 3.7	3 14 29.69	16 59 11.9	5.3	5.1	0.36
8	22 33.2	23 46 26.46	3 5 15.9	5.9	5.7	0.38	24	23 4.7	3 19 24.70	17 20 8.6	5.3	5.1	0.36
9	22 33.8	23 50 57.79	2 36 48.7	5.9	5.7	0.38	25	23 5.7	3 24 20.85	17 40 39.0	5.3	5.1	0.36
10	22 34.4	23 55 28.87	2 8 16.1	5.9	5.6	0.38	26	23 6.7	3 29 18.13	18 0 42.3	5.3	5.1	0.36
11	22 34.9	23 59 59.73	− 1 39 39.0	5.8	5.6	0.38	27	23 7.7	3 34 16.55	+18 20 17.8	5.3	5.1	0.36
12	22 35.5	0 4 30.40	1 10 58.0	5.8	5.6	0.37	28	23 8.7	3 39 16.10	18 39 24.8	5.2	5.1	0.36
13	22 36.0	0 9 0.92	0 42 13.7	5.8	5.6	0.37	29	23 9.8	3 44 16.79	18 58 2.8	5.2	5.1	0.36
14	22 36.6	0 13 31.33	− 0 13 26.8	5.8	5.6	0.37	30	23 10.9	3 49 18.61	19 16 10.9	5.2	5.1	0.36
15	22 37.2	0 18 1.66	+ 0 15 21.9	5.8	5.6	0.37	31	23 12.0	3 54 21.56	19 33 48.6	5.2	5.1	0.36
16	22 37.8	0 22 31.95	+ 0 44 11.8	5.7	5.5	0.37	June 1	23 13.2	3 59 25.62	+19 50 55.1	5.2	5.0	0.36
17	22 38.3	0 27 2.24	1 13 2.1	5.7	5.5	0.37	2	23 14.4	4 4 30.79	20 7 29.8	5.2	5.0	0.36
18	22 38.9	0 31 32.58	1 41 52.3	5.7	5.5	0.37	3	23 15.5	4 9 37.06	20 23 32.1	5.2	5.0	0.36
19	22 39.4	0 36 3.00	2 10 41.6	5.7	5.5	0.37	4	23 16.7	4 14 44.41	20 39 1.3	5.2	5.0	0.36
20	22 40.0	0 40 33.54	2 39 29.3	5.7	5.5	0.37	5	23 17.9	4 19 52.81	20 53 56.7	5.2	5.0	0.36
21	22 40.5	0 45 4.23	+ 3 8 14.7	5.7	5.5	0.36	6	23 19.1	4 25 2.25	+21 8 17.8	5.2	5.0	0.36
22	22 41.1	0 49 35.13	3 36 57.2	5.6	5.4	0.36	7	23 20.3	4 30 12.69	21 22 3.9	5.2	5.0	0.36
23	22 41.7	0 54 6.27	4 5 36.0	5.6	5.4	0.36	8	23 21.5	4 35 24.12	21 35 14.6	5.2	5.0	0.36
24	22 42.3	0 58 37.70	4 34 10.5	5.6	5.4	0.36	9	23 22.7	4 40 36.50	21 47 49.3	5.2	5.0	0.36
25	22 42.8	1 3 9.46	5 2 40.2	5.6	5.4	0.36	10	23 24.0	4 45 49.81	21 59 47.4	5.2	5.0	0.36
26	22 43.4	1 7 41.57	+ 5 31 4.2	5.6	5.4	0.36	11	23 25.3	4 51 4.01	+22 11 8.4	5.2	5.0	0.36
27	22 44.0	1 12 14.09	5 59 21.8	5.6	5.1	0.36	12	23 26.6	4 56 19.04	22 21 51.7	5.2	5.0	0.36
28	22 44.6	1 16 47.06	6 27 32.4	5.6	5.4	0.36	13	23 27.9	5 1 34.89	22 31 56.9	5.2	5.0	0.36
29	22 45.2	1 21 20.51	6 55 35.3	5.5	5.4	0.36	14	23 29.3	5 6 51.51	22 41 23.5	5.1	5.0	0.36
30	22 45.8	1 25 54.47	7 23 29.8	5.5	5.3	0.36	15	23 30.6	5 12 8.85	22 50 11.0	5.1	5.0	0.36
May 1	22 46.5	1 30 28.99	+ 7 51 15.2	5.5	5.3	0.36	16	23 32.0	5 17 26.86	+22 58 19.2	5.1	5.0	0.36
2	22 47.1	1 35 4.10	8 18 50.7	5.5	5.3	0.36	17	23 33.3	5 22 45.52	23 5 47.6	5.1	5.0	0.36
3	22 47.8	1 39 39.83	8 46 15.7	5.5	5.3	0.36	18	23 34.7	5 28 4.78	23 12 35.9	5.1	5.0	0.36
4	22 48.4	1 44 16.22	9 13 29.5	5.5	5.3	0.36	19	23 36.1	5 33 24.58	23 18 43.7	5.1	5.0	0.36
5	22 49.1	1 48 53.30	9 40 31.3	5.5	5.3	0.36	20	23 37.5	5 38 44.88	23 24 10.6	5.1	5.0	0.36
6	22 49.8	1 53 31.10	+10 7 20.5	5 5	5.3	0.36	21	23 38.9	5 44 5.62	+23 28 56.5	5.1	5.0	0.36
7	22 50.5	1 58 9.65	10 33 56.2	5.4	5.3	0.36	22	23 40.3	5 49 26.78	23 33 1.1	5.1	5.0	0.36
8	22 51.2	2 2 48.98	11 0 17.9	5.4	5.3	0.36	23	23 41.7	5 54 48.24	23 36 24.1	5.1	5.0	0.36
9	22 51.9	2 7 29.12	11 26 24.7	5.4	5.2	0.36	24	23 43.1	6 0 10.01	23 39 5.3	5.1	4.9	0.36
10	22 52.7	2 12 10.10	11 52 15.9	5.4	5.2	0.36	25	23 44.5	6 5 32.02	23 41 4.7	5.1	4.9	0.36
11	22 53.5	2 16 51.94	+12 17 50.8	5.4	5.2	0.36	26	23 45.9	6 10 54.21	+23 42 22.1	5.1	4.9	0.36
12	22 54.2	2 21 34.67	12 43 8.7	5.4	5.2	0.36	27	23 47.3	6 16 16.52	23 42 57.5	5.1	4.9	0.36
13	22 55.0	2 26 18.31	13 8 8.9	5.4	5.2	0.36	28	23 48.8	6 21 38.90	23 42 50.7	5.1	4.9	0.36
14	22 55.8	2 31 2.88	13 32 50.5	5.4	5.2	0.36	29	23 50.2	6 27 1.29	23 42 1.6	5.1	4.9	0.36
15	22 56.6	2 35 48.41	13 57 12.8	5.4	5.2	0.36	30	23 51.6	6 32 23.63	23 40 30.2	5.1	4.9	0.36
16	22 57.4	2 40 34.93	+14 21 15.2	5.3	5.2	0.36	31	23 53.0	6 37 45.87	+23 38 16.5	5.1	4.9	0.36
17	22 58.3	2 45 22.46	+14 44 56.9	5.3	5.2	0.36	32	23 54.5	6 43 7.94	+23 35 20.7	5.1	4.9	0.36

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
July 1	23 53.0	6 37 45.87	+23 38 16.5	5.1	4.9	0.36	Aug. 17	0 44.8	10 30 57.32	+10 52 49.6	5.2	5.0	0.34
2	23 54.5	6 43 7.94	23 35 20.7	5.1	4.9	0.36	18	0 45.5	10 35 37.57	10 25 18.7	5.2	5.0	0.34
3	23 55.9	6 48 29.79	23 31 42.7	5.1	4.9	0.36	19	0 46.2	10 40 16.95	9 57 31.1	5.2	5.1	0.34
4	23 57.3	6 53 51.36	23 27 22.7	5.1	4.9	0.36	20	0 46.9	10 44 55.50	9 29 27.6	5.2	5.1	0.34
5	23 58.7	6 59 12.61	23 22 20.9	5.1	4.9	0.36	21	0 47.6	10 49 33.26	9 1 8.8	5.3	5.1	0.34
7	0 0.2	7 4 33.45	+23 16 37.4	5.1	4.9	0.36	22	0 48.4	10 54 10.26	+ 8 32 35.5	5.3	5.1	0.34
8	0 1.6	7 9 53.84	23 10 12.5	5.1	4.9	0.36	23	0 49.1	10 58 46.54	8 3 48.3	5.3	5.1	0.34
9	0 3.0	7 15 13.72	23 3 6.3	5.1	4.9	0.36	24	0 49.8	11 3 22.13	7 34 48.2	5.3	5.1	0.34
10	0 4.4	7 20 33.04	22 55 19.1	5.1	4.9	0.36	25	0 50.4	11 7 57.08	7 5 35.8	5.3	5.1	0.34
11	0 5.7	7 25 51.75	22 46 51.2	5.1	4.9	0.36	26	0 51.0	11 12 31.42	6 36 11.6	5.3	5.1	0.34
12	0 7.1	7 31 9.80	+22 37 42.9	5.1	4.9	0.36	27	0 51.6	11 17 5.19	+ 6 6 36.5	5.3	5.1	0.34
13	0 8.4	7 36 27.14	22 27 54.6	5.1	4.9	0.36	28	0 52.2	11 21 38.42	5 36 51.1	5.3	5.1	0.34
14	0 9.7	7 41 43.73	22 17 26.7	5.1	4.9	0.36	29	0 52.8	11 26 11.17	5 6 56.3	5.3	5.1	0.34
15	0 11.0	7 46 59.51	22 6 19.5	5.1	4.9	0.35	30	0 53.4	11 30 43.46	4 36 52.7	5.3	5.1	0.35
16	0 12.3	7 52 14.47	21 54 33.5	5.1	4.9	0.35	31	0 54.0	11 35 15.34	4 6 41.1	5.3	5.2	0.35
17	0 13.5	7 57 28.55	+21 42 9.1	5.1	4.9	0.35	Sept. 1	0 54.5	11 39 46.86	+ 3 36 22.1	5.3	5.2	0.35
18	0 14.8	8 2 41.70	21 29 6.7	5.1	4.9	0.35	2	0 55.1	11 44 18.05	3 5 56.5	5.4	5.2	0.35
19	0 16.0	8 7 53.91	21 15 26.8	5.1	4.9	0.35	3	0 55.6	11 48 48.95	2 35 25.0	5.4	5.2	0.35
20	0 17.3	8 13 5.14	21 1 10.0	5.1	4.9	0.35	4	0 56.2	11 53 19.60	2 4 48.4	5.4	5.2	0.35
21	0 18.5	8 18 15.37	20 46 16.7	5.1	4.9	0.35	5	0 56.7	11 57 50.04	1 34 7.3	5.4	5.2	0.35
22	0 19.8	8 23 24.58	+20 30 47.6	5.1	4.9	0.35	6	0 57.3	12 2 20.32	+ 1 3 22.5	5.4	5.2	0.35
23	0 21.0	8 28 32.74	20 14 43.2	5.1	4.9	0.35	7	0 57.9	12 6 50.46	0 32 34.8	5.4	5.2	0.35
24	0 22.2	8 33 39.82	19 58 4.1	5.1	4.9	0.35	8	0 58.5	12 11 20.51	+ 0 1 45.0	5.4	5.2	0.35
25	0 23.4	8 38 45.82	19 40 50.8	5.1	5.0	0.35	9	0 59.0	12 15 50.51	− 0 29 6.4	5.4	5.2	0.35
26	0 24.5	8 43 50.73	19 23 3.9	5.1	5.0	0.35	10	0 59.6	12 20 20.51	0 59 58.5	5.4	5.2	0.35
27	0 25.6	8 48 54.52	+19 4 44.1	5.1	5.0	0.35	11	1 0.1	12 24 50.54	− 1 30 50.6	5.4	5.3	0.35
28	0 26.7	8 53 57.20	18 45 52.0	5.1	5.0	0.35	12	1 0.7	12 29 20.66	2 1 42.0	5.5	5.3	0.35
29	0 27.8	8 58 58.75	18 26 28.1	5.1	5.0	0.35	13	1 1.2	12 33 50.90	2 32 32.0	5.5	5.3	0.35
30	0 28.9	9 3 59.17	18 6 33.2	5.1	5.0	0.35	14	1 1.8	12 38 21.29	3 3 19.7	5.5	5.3	0.35
31	0 29.9	9 8 58.44	17 46 7.9	5.1	5.0	0.35	15	1 2.3	12 42 51.89	3 34 4.4	5.5	5.3	0.35
Aug. 1	0 31.0	9 13 56.58	+17 25 12.9	5.1	5.0	0.35	16	1 2.9	12 47 22.75	− 4 4 45.5	5.5	5.3	0.35
2	0 32.0	9 18 53.58	17 3 48.9	5.1	5.0	0.35	17	1 3.5	12 51 53.89	4 35 22.2	5.5	5.3	0.36
3	0 33.0	9 23 49.44	16 41 56.6	5.1	5.0	0.35	18	1 4.1	12 56 25.36	5 5 53.8	5.5	5.3	0.36
4	0 34.0	9 28 44.17	16 19 36.7	5.2	5.0	0.35	19	1 4.6	13 0 57.21	5 36 19.5	5.5	5.4	0.36
5	0 35.0	9 33 37.78	15 56 49.8	5.2	5.0	0.35	20	1 5.2	13 5 29.48	6 6 38.5	5.6	5.4	0.36
6	0 35.9	9 38 30.26	+15 33 36.6	5.2	5.0	0.35	21	1 5.8	13 10 2.22	− 6 36 50.1	5.6	5.4	0.36
7	0 36.8	9 43 21.62	15 9 58.0	5.2	5.0	0.35	22	1 6.4	13 14 35.47	7 6 53.6	5.6	5.4	0.36
8	0 37.7	9 48 11.88	14 45 54.6	5.2	5.0	0.35	23	1 7.0	13 19 9.27	7 36 48.2	5.6	5.4	0.36
9	0 38.6	9 53 1.06	14 21 27.1	5.2	5.0	0.34	24	1 7.6	13 23 43.66	8 6 33.4	5.6	5.4	0.36
10	0 39.4	9 57 49.16	13 56 36.3	5.2	5.0	0.34	25	1 8.3	13 28 18.67	8 36 8.3	5.6	5.4	0.37
11	0 40.2	10 2 36.19	+13 31 22.9	5.2	5.0	0.34	26	1 8.9	13 32 54.36	− 9 5 32.1	5.6	5.4	0.37
12	0 41.0	10 7 22.19	13 5 47.7	5.2	5.0	0.34	27	1 9.6	13 37 30.78	9 34 44.2	5.6	5.5	0.37
13	0 41.8	10 12 7.16	12 39 51.4	5.2	5.0	0.34	28	1 10.3	13 42 7.96	10 3 43.8	5.7	5.5	0.37
14	0 42.6	10 16 51.13	12 13 34.7	5.2	5.0	0.34	29	1 11.0	13 46 45.93	10 32 30.1	5.7	5.5	0.37
15	0 43.3	10 21 34.13	11 46 58.3	5.2	5.0	0.34	30	1 11.7	13 51 24.73	11 1 2.3	5.7	5.5	0.37
16	0 44.0	10 26 16.19	+11 20 3.0	5.2	5.0	0.34	31	1 12.4	13 56 4.39	−11 29 19.5	5.7	5.5	0.38
17	0 44.8	10 30 57.32	+10 52 49.6	5.2	5.0	0.34	32	1 13.2	14 0 44.95	−11 57 21.2	5.7	5.5	0.38

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Oct. 1	1 12.4	13 56 4.39	−11 29 19.5	5.7	5.5	0.38	Nov. 16	2 4.8	17 49 53.50	−25 2 25.3	6.7	6.4	0.48
2	1 13.2	14 0 44.95	11 57 21.2	5 7	5.5	0.38	17	2 6.2	17 55 18.27	25 5 18.8	6.7	6.5	0.48
3	1 14.0	14 5 26.43	12 25 6.5	5.7	5.5	0.38	18	2 7.7	18 0 43.13	25 7 27.3	6.7	6.5	0.48
4	1 14.7	14 10 8.87	12 52 34.6	5.8	5.6	0.38	19	2 9.1	18 6 8.04	25 8 50.8	6.8	6.5	0.48
5	1 15.5	14 14 52.30	13 19 44.7	5.8	5.6	0.38	20	2 10.6	18 11 32.92	25 9 29.1	6.8	6.6	0.48
6	1 16.3	14 19 36.75	−13 46 36.0	5.8	5.6	0.38	21	2 12.0	18 16 57.70	−25 9 22.2	6.8	6.6	0.49
7	1 17.1	14 24 22.24	14 13 7.8	5.8	5.6	0.39	22	2 13.5	18 22 22.30	25 8 30.3	6.9	6.6	0.49
8	1 17.9	14 29 8.80	14 39 19.3	5.8	5.6	0.39	23	2 14.9	18 27 46.67	25 6 53.2	6.9	6.6	0.49
9	1 18.8	14 33 56.45	15 5 9.6	5.8	5.6	0.39	24	2 16.4	18 33 10.73	25 4 30.9	6.9	6.7	0.49
10	1 19.6	14 38 45.20	15 30 37.8	5.9	5.7	0.39	25	2 17.8	18 38 34.41	25 1 23.5	6.9	6.7	0.49
11	1 20.5	14 43 35.07	−15 55 43.3	5.9	5.7	0.39	26	2 19.3	18 43 57.66	−24 57 31.3	7.0	6.7	0.50
12	1 21.4	14 48 26.09	16 20 25.2	5.9	5.7	0.40	27	2 20.7	18 49 20.41	24 52 54.6	7.0	6.8	0.50
13	1 22.3	14 53 18.27	16 44 42.7	5.9	5.7	0.40	28	2 22.2	18 54 42.57	24 47 33.5	7.0	6.8	0.50
14	1 23.2	14 58 11.63	17 8 35.0	5.9	5.7	0.40	29	2 23.6	19 0 4.09	24 41 28.2	7.1	6.8	0.50
15	1 24.2	15 3 6.17	17 32 1.3	5.9	5.8	0.40	30	2 25.0	19 5 24.90	24 34 39.0	7.1	6.9	0.50
16	1 25.2	15 8 1.91	−17 55 1.0	6.0	5.8	0.40	Dec. 1	2 26.4	19 10 44.95	−24 27 6.0	7.1	6.9	0.51
17	1 26.2	15 12 58.86	18 17 33.1	6.0	5.8	0.41	2	2 27.8	19 16 4.17	24 18 49.9	7.2	6.9	0.51
18	1 27.2	15 17 57.03	18 39 36.9	6.0	5.8	0.41	3	2 29.2	19 21 22.47	24 9 50.9	7.2	7.0	0.51
19	1 28.3	15 22 56.43	19 1 11.6	6.0	5.8	0.41	4	2 30.5	19 26 39.81	24 0 9.4	7.2	7.0	0.51
20	1 29.3	15 27 57.04	19 22 16.5	6.0	5.8	0.41	5	2 31.8	19 31 56.14	23 49 45.8	7.3	7.0	0.51
21	1 30.4	15 32 58.88	−19 42 50.9	6.1	5.9	0.42	6	2 33.1	19 37 11.38	−23 38 40.7	7.3	7.1	0.52
22	1 31.5	15 38 1.95	20 2 53.9	6.1	5.9	0.42	7	2 34.4	19 42 25.49	23 26 54.5	7.4	7.1	0.52
23	1 32.6	15 43 6.26	20 22 24.8	6.1	5.9	0.42	8	2 35.7	19 47 38.42	23 14 27.8	7.4	7.2	0.52
24	1 33.8	15 48 11.78	20 41 22.9	6.1	5.9	0.42	9	2 37.0	19 52 50.11	23 1 21.0	7.4	7.2	0.52
25	1 35.0	15 53 18.51	20 59 47.6	6.1	5.9	0.42	10	2 38.2	19 58 0.52	22 47 34.7	7.5	7.2	0.52
26	1 36.2	15 58 26.43	−21 17 38.0	6.2	6.0	0.43	11	2 39.4	20 3 9.60	−22 33 9.6	7.5	7.3	0.52
27	1 37.4	16 3 35.53	21 34 53.5	6.2	6.0	0.43	12	2 40.5	20 8 17.31	22 18 6.3	7.5	7.3	0.53
28	1 38.6	16 8 45.80	21 51 33.4	6.2	6.0	0.43	13	2 41.7	20 13 23.61	22 2 25.4	7.6	7.3	0.53
29	1 39.9	16 13 57.22	22 7 37.0	6.2	6.0	0.43	14	2 42.8	20 18 28.46	21 46 7.6	7.6	7.4	0.53
30	1 41.1	16 19 9.76	22 23 3.8	6.3	6.0	0.44	15	2 43.9	20 23 31.84	21 29 13.5	7.7	7.4	0.53
31	1 42.4	16 24 23.39	−22 37 53.0	6.3	6.1	0.44	16	2 45.0	20 28 33.72	−21 11 43.7	7.7	7.5	0.53
Nov. 1	1 43.7	16 29 38.07	22 52 4.1	6.3	6.1	0.44	17	2 46.1	20 33 34.08	20 53 39.0	7.8	7.5	0.53
2	1 45.0	16 34 53.78	23 5 36.3	6.3	6.1	0.44	18	2 47.1	20 38 32.90	20 35 0.2	7.8	7.5	0.54
3	1 46.3	16 40 10.46	23 18 29.0	6.3	6.1	0.44	19	2 48.1	20 43 30.16	20 15 47.9	7.8	7.6	0.54
4	1 47.7	16 45 28.08	23 30 41.8	6.4	6.2	0.45	20	2 49.1	20 48 25.83	19 56 2.8	7.9	7.6	0.54
5	1 49.0	16 50 46.60	−23 42 14.1	6.4	6.2	0.45	21	2 50.1	20 53 19.92	−19 35 45.8	7.9	7.7	0.54
6	1 50.4	16 56 5.97	23 53 5.4	6.4	6.2	0.45	22	2 51.0	20 58 12.41	19 14 57.6	8.0	7.7	0.54
7	1 51.8	17 1 26.13	24 3 15.1	6.4	6.2	0.45	23	2 51.9	21 3 3.29	18 53 38.9	8.0	7.7	0.55
8	1 53.2	17 6 47.02	24 12 42.8	6.5	6.2	0.46	24	2 52.8	21 7 52.57	18 31 50.6	8.1	7.8	0.55
9	1 54.6	17 12 8.59	24 21 28.1	6.5	6.3	0.46	25	2 53.7	21 12 40.23	18 9 33.3	8.1	7.8	0.55
10	1 56.0	17 17 30.77	−24 29 30.5	6.5	6.3	0.46	26	2 54.5	21 17 26.29	−17 46 47.8	8.2	7.9	0.55
11	1 57.4	17 22 53.51	24 36 49.6	6.6	6.3	0.46	27	2 55.3	21 22 10.73	17 23 34.8	8.2	7.9	0.56
12	1 58.9	17 28 16.77	24 43 25.0	6.6	6.3	0.47	28	2 56.0	21 26 53.55	16 59 55.3	8.3	8.0	0.56
13	2 0.3	17 33 40.47	24 49 16.6	6.6	6.4	0.47	29	2 56.7	21 31 34.77	16 35 49.9	8.3	8.0	0.56
14	2 1.8	17 39 4.53	24 54 24.0	6.6	6.4	0.47	30	2 57.4	21 36 14.39	16 11 19.5	8.4	8.1	0.56
15	2 3.3	17 44 28.90	−24 58 47.0	6.7	6.4	0.47	31	2 58.1	21 40 52.42	−15 46 24.9	8.4	8.1	0.56
16	2 4.8	17 49 53.50	−25 2 25.3	6.7	6.4	0.48	32	2 58.8	21 45 28.85	−15 21 6.9	8.5	8.2	0.57

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Jan. 0	18 8.5	12 50 41.34	−3 8 24.6	6.4	3.6	0.24	Feb. 15	16 6.7	13 49 53.71	−8 33 55.4	9.4	5.4	0.36
1	18 6.2	12 52 22.51	3 18 23.8	6.4	3.7	0.24	16	16 3.4	13 50 34.98	8 37 13.8	9.5	5.4	0.37
2	18 4.0	12 54 2.97	3 28 17.0	6.4	3.7	0.25	17	16 0.1	13 51 14.10	8 40 20.6	9.6	5.5	0.37
3	18 1.7	12 55 42.68	3 38 4.1	6.5	3.7	0.25	18	15 56.8	13 51 51.04	8 43 15.5	9.7	5.5	0.38
4	17 59.4	12 57 21.64	3 47 45.0	6.5	3.7	0.25	19	15 53.4	13 52 25.76	8 45 58.6	9.8	5.6	0.38
5	17 57.1	12 58 59.81	−3 57 19.3	6.6	3.8	0.25	20	15 50.0	13 52 58.23	−8 48 29.5	9.9	5.6	0.38
6	17 54.8	13 0 37.18	4 6 47.2	6.6	3.8	0.25	21	15 46.6	13 53 28.40	8 50 48.4	10.0	5.7	0.39
7	17 52.5	13 2 13.74	4 16 8.4	6.7	3.8	0.26	22	15 43.1	13 53 56.22	8 52 55.0	10.1	5.8	0.39
8	17 50.1	13 3 49.46	4 25 22.9	6.7	3.9	0.26	23	15 39.7	13 54 21.66	8 54 49.4	10.2	5.8	0.39
9	17 47.8	13 5 24.31	4 34 30.5	6.8	3.9	0.26	24	15 36.1	13 54 44.69	8 56 31.3	10.3	5.9	0.40
10	17 45.4	13 6 58.27	−4 43 31.1	6.8	3.9	0.26	25	15 32.5	13 55 5.25	−8 58 0.7	10.4	5.9	0.40
11	17 43.0	13 8 31.32	4 52 24.4	6.9	3.9	0.26	26	15 28.9	13 55 23.28	8 59 17.3	10.5	6.0	0.40
12	17 40.6	13 10 3.44	5 1 10.5	6.9	4.0	0.27	27	15 25.2	13 55 38.76	9 0 21.0	10.6	6.1	0.41
13	17 38.2	13 11 34.60	5 9 49.2	7.0	4.0	0.27	28	15 21.5	13 55 51.63	9 1 11.8	10.7	6.1	0.41
14	17 35 8	13 13 4.79	5 18 20.4	7.1	4.0	0.27	29	15 17.8	13 56 1.86	9 1 49.5	10.8	6.2	0.41
15	17 33.3	13 14 33.98	−5 26 44.0	7.1	4.1	0.27	Mar. 1	15 14.0	13 56 9.39	−9 2 13.9	10.9	6.2	0.42
16	17 30.9	13 16 2.15	5 34 59.8	7.2	4.1	0.27	2	15 10.1	13 56 14.18	9 2 25.0	11.0	6.3	0.42
17	17 28.4	13 17 29.28	5 43 7.9	7.2	4.2	0.28	3	15 6.2	13 56 16.20	9 2 22.6	11.1	6.3	0.43
18	17 25.9	13 18 55.35	5 51 8.1	7.3	4.2	0.28	4	15 2.3	13 56 15.41	9 2 6.6	11.2	6.4	0.43
19	17 23.4	13 20 20.32	5 59 0.2	7.4	4.2	0.28	5	14 58.3	13 56 11.76	9 1 36.8	11.3	6.5	0.44
20	17 20.8	13 21 44.19	−6 6 44.2	7.4	4.3	0.28	6	14 54.2	13 56 5.22	−9 0 53.2	11.4	6.5	0.44
21	17 18.3	13 23 6.92	6 14 19.9	7.5	4.3	0.29	7	14 50.1	13 55 55.78	8 59 55.8	11.5	6.6	0.44
22	17 15.7	13 24 28.50	6 21 47.3	7.5	4.3	0.29	8	14 46.0	13 55 43.40	8 58 44.5	11.7	6.6	0.45
23	17 13.1	13 25 48.89	6 29 6.3	7.6	4.4	0.29	9	14 41.9	13 55 28.05	8 57 19.1	11.8	6.7	0.45
24	17 10.5	13 27 8.07	6 36 16.7	7.7	4.4	0.29	10	14 37.6	13 55 9.72	8 55 39.7	11.9	6.8	0.46
25	17 7.8	13 28 26.02	−6 43 18.6	7.8	4.4	0.30	11	14 33.3	13 54 48.40	−8 53 46.3	12.0	6.8	0.46
26	17 5.2	13 29 42.70	6 50 11.8	7.8	4.5	0.30	12	14 28.9	13 54 24.09	8 51 38.9	12.1	6.9	0.47
27	17 2.5	13 30 58.09	6 56 56.1	7.9	4.5	0.30	13	14 24.5	13 53 56.79	8 49 17.6	12.2	7.0	0.47
28	16 59.8	13 32 12.15	7 3 31.4	8.0	4.5	0.31	14	14 20.1	13 53 26.51	8 46 42.4	12.3	7.1	0.47
29	16 57.1	13 33 24.84	7 9 57.7	8.1	4.6	0.31	15	14 15.6	13 52 53.25	8 43 53.5	12.4	7.2	0.48
30	16 54.3	13 34 36.14	−7 16 14.7	8.1	4.6	0.31	16	14 11.1	13 52 17.04	−8 40 51.0	12.5	7.2	0.48
31	16 51.5	13 35 46.00	7 22 22.4	8.2	4.7	0.31	17	14 6.5	13 51 37.90	8 37 35.1	12.6	7.3	0.49
Feb. 1	16 48.7	13 36 54.39	7 28 20.6	8.2	4.7	0.32	18	14 1.9	13 50 55.86	8 34 6.0	12.7	7.4	0.49
2	16 45.9	13 38 1.26	7 34 9.1	8.3	4.7	0.32	19	13 57.2	13 50 10.95	8 30 23.8	12.8	7.4	0.49
3	16 43.1	13 39 6.57	7 39 47.8	8.4	4.8	0.32	20	13 52.5	13 49 23.22	8 26 28.7	12.9	7.5	0.50
4	16 40.2	13 40 10.30	−7 45 16.6	8.5	4.8	0.32	21	13 47.7	13 48 32.69	−8 22 21.1	13.0	7.5	0.50
5	16 37.3	13 41 12.38	7 50 35.3	8.6	4.9	0.33	22	13 42.9	13 47 39.44	8 18 1.3	13.1	7.6	0.51
6	16 34.4	13 42 12.79	7 55 43.8	8.6	4.9	0.33	23	13 38.1	13 46 43.48	8 13 29.5	13.2	7.6	0.51
7	16 31.5	13 43 11.47	8 0 41.9	8.7	4.9	0.33	24	13 33.1	13 45 44.90	8 8 46.0	13.2	7.7	0.51
8	16 28.5	13 44 8.38	8 5 29.4	8.8	5.0	0.34	25	13 28.2	13 44 43.77	8 3 51.3	13.3	7.7	0.52
9	16 25.5	13 45 3.48	−8 10 6.2	8.9	5.0	0.34	26	13 23.2	13 43 40.17	−7 58 45.7	13.4	7.8	0.52
10	16 22.4	13 45 56.72	8 14 32.2	9.0	5.1	0.34	27	13 18.2	13 42 34.17	7 53 29.6	13.5	7.8	0.52
11	16 19.3	13 46 48.07	8 18 47.3	9.1	5.2	0.35	28	13 13.1	13 41 25.83	7 48 3.4	13.6	7.9	0.53
12	16 16.2	13 47 37.49	8 22 51.3	9.1	5.2	0.35	29	13 8.0	13 40 15.25	7 42 27.6	13.7	7.9	0.53
13	16 13.1	13 48 24.93	8 26 44.1	9.2	5.3	0.36	30	13 2.9	13 39 2.54	7 36 42.8	13.8	8.0	0.53
14	16 9.9	13 49 10.35	−8 30 25.5	9.3	5.3	0.36	31	12 57.7	13 37 47.79	−7 30 49.5	13.9	8.0	0.54
15	16 6.7	13 49 53.71	−8 33 55.4	9.4	5.4	0.36	32	12 52.5	13 36 31.13	−7 24 48.2	14.0	8.0	0.54

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Apr. 1	12 52.5	13 36 31.13	−7 24 48.2	14.0	8.0	0.54	May 17	9 0.5	12 45 23.07	−4 8 4.1	12.9	7.4	0.49
2	12 47.2	13 35 12.68	7 18 39.7	14.1	8.0	0.54	18	8 56.4	12 45 8.73	4 9 12.2	12.8	7.3	0.49
3	12 42.0	13 33 52.55	7 12 24.5	14.1	8.1	0.54	19	8 52.3	12 44 57.37	4 10 37.5	12.8	7.3	0.49
4	12 36.7	13 32 30.88	7 6 3.3	14.2	8.1	0.54	20	8 48.2	12 44 48.96	4 12 19.9	12.7	7.2	0.48
5	12 31.4	13 31 7.80	6 59 36.8	14.2	8.1	0.55	21	8 44.2	12 44 43.49	4 14 19.1	12.6	7.2	0.48
6	12 26.1	13 29 43.49	−6 53 6.0	14.3	8.2	0.55	22	8 40.2	12 44 40.93	−4 16 34.9	12.5	7.1	0.47
7	12 20.7	13 28 18.10	6 46 31.7	14.3	8.2	0.55	23	8 36.3	12 44 41.24	4 19 7.2	12.4	7.1	0.47
8	12 15.3	13 26 51.80	6 39 54.7	14.4	8.2	0.55	24	8 32.4	12 44 44.38	4 21 55.7	12.3	7.0	0.47
9	12 10.0	13 25 24.74	6 33 15.9	14.4	8.3	0.55	25	8 28.6	12 44 50.33	4 25 0.2	12.2	7.0	0.46
10	12 4.6	13 23 57.10	6 26 36.2	14.5	8.3	0.56	26	8 24.8	12 44 59.05	4 28 20.3	12.1	6.9	0.46
11	11 59.2	13 22 29.05	−6 19 56.5	14.5	8.3	0.56	27	8 21.0	12 45 10.51	−4 31 55.9	12.0	6.9	0.46
12	11 53.8	13 21 0.78	6 13 17.8	14.5	8.3	0.56	28	8 17.3	12 45 24.67	4 35 46.6	11.9	6.8	0.46
13	11 48.4	13 19 32.47	6 6 41.0	14.5	8.3	0.56	29	8 13.7	12 45 41.51	4 39 52.3	11.9	6.8	0.45
14	11 42.9	13 18 4.28	6 0 7.1	14.5	8.3	0.56	30	8 10.1	12 46 0.97	4 44 12.7	11.8	6.7	0.45
15	11 37.5	13 16 36.40	5 53 37.1	14.6	8.3	0.56	31	8 6.5	12 46 23.03	4 48 47.6	11.7	6.7	0.45
16	11 32.1	13 15 9.00	−5 47 11.9	14.6	8.3	0.56	June 1	8 3.0	12 46 47.67	−4 53 36.7	11.6	6.6	0.45
17	11 26.8	13 13 42.24	5 40 52.3	14.6	8.3	0.56	2	7 59.5	12 47 14.84	4 58 39.7	11.5	6.6	0.44
18	11 21.4	13 12 16.28	5 34 39.3	14.6	8.3	0.56	3	7 56.1	12 47 44.52	5 3 56.5	11.4	6.5	0.44
19	11 16.1	13 10 51.28	5 28 33.7	14.6	8.3	0.56	4	7 52.8	12 48 16.68	5 9 26.9	11.3	6.5	0.44
20	11 10.8	13 9 27.41	5 22 36.5	14.6	8.3	0.56	5	7 49.4	12 48 51.29	5 15 10.7	11.2	6.4	0.43
21	11 5.5	13 8 4.83	−5 16 48.3	14.6	8.3	0.56	6	7 46.1	12 49 28.31	−5 21 7.6	11.2	6.4	0.43
22	11 0.2	13 6 43.64	5 11 9.9	14.5	8.3	0.55	7	7 42.8	12 50 7.71	5 27 17.3	11.1	6.3	0.43
23	10 54.9	13 5 23.98	5 5 41.9	14.5	8.3	0.55	8	7 39.5	12 50 49.45	5 33 39.5	11.0	6.3	0.42
24	10 49.7	13 4 5.99	5 0 25.1	14.4	8.3	0.55	9	7 36.3	12 51 33.49	5 40 14.0	10.9	6.2	0.42
25	10 44.5	13 2 49.80	4 55 20.2	14.4	8.2	0.55	10	7 33.1	12 52 19.80	5 47 0.7	10.8	6.2	0.42
26	10 39.3	13 1 35.52	−4 50 27.7	14.4	8.2	0.55	11	7 30.0	12 53 8.35	−5 53 59.2	10.8	6.1	0.41
27	10 34.2	13 0 23.27	4 45 48.3	14.3	8.2	0.55	12	7 26.9	12 53 59.09	6 1 9.4	10.7	6.1	0.41
28	10 29.1	12 59 13.13	4 41 22.5	14.3	8.2	0.55	13	7 23.9	12 54 51.99	6 8 30.8	10.6	6.0	0.41
29	10 24.0	12 58 5.21	4 37 10.6	14.3	8.1	0.54	14	7 20.9	12 55 47.00	6 16 3.2	10.5	6.0	0.40
30	10 19.0	12 56 59.61	4 33 13.2	14.2	8.1	0.54	15	7 17.9	12 56 44.09	6 23 46.3	10.4	6.0	0.40
May 1	10 14.0	12 55 56.40	−4 29 30.8	14.2	8.1	0.54	16	7 15.0	12 57 43.21	−6 31 39.9	10.4	5.9	0.40
2	10 9.1	12 54 55.69	4 26 3.7	14.1	8.0	0.54	17	7 12.0	12 58 44.33	6 39 43.7	10.3	5.9	0.39
3	10 4.2	12 53 57.55	4 22 52.4	14.0	8.0	0.54	18	7 9.1	12 59 47.40	6 47 57.4	10.2	5.8	0.39
4	9 59.3	12 53 2.05	4 19 57.2	14.0	8.0	0.53	19	7 6.3	13 0 52.40	6 56 20.8	10.1	5.8	0.39
5	9 54.5	12 52 9.26	4 17 18.4	13.9	7.9	0.53	20	7 3.4	13 1 59.27	7 4 53.4	10.1	5.7	0.39
6	9 49.8	12 51 19.23	−4 14 56.4	13.8	7.9	0.53	21	7 0.6	13 3 7.98	−7 13 35.1	10.0	5.7	0.38
7	9 45.0	12 50 32.03	4 12 51.3	13.7	7.8	0.52	22	6 57.9	13 4 18.52	7 22 25.6	9.9	5.7	0.38
8	9 40.4	12 49 47.71	4 11 3.4	13.7	7.8	0.52	23	6 55.2	13 5 30.82	7 31 24.6	9.8	5.6	0.38
9	9 35.8	12 49 6.32	4 9 32.9	13.6	7.8	0.52	24	6 52.5	13 6 44.88	7 40 31.8	9.8	5.6	0.38
10	9 31.2	12 48 27.88	4 8 19.9	13.5	7.7	0.52	25	6 49.8	13 8 0.66	7 49 47.0	9.7	5.5	0.37
11	9 26.6	12 47 52.43	−4 7 24.6	13.5	7.7	0.51	26	6 47.2	13 9 18.13	−7 59 10.0	9.6	5.5	0.37
12	9 22.2	12 47 19.98	4 6 46.9	13.4	7.6	0.51	27	6 44.6	13 10 37.27	8 8 40.5	9.6	5.5	0.37
13	9 17.8	12 46 50.54	4 6 27.0	13.3	7.6	0.51	28	6 42.0	13 11 58.05	8 18 18.3	9.5	5.4	0.36
14	9 13.4	12 46 24.13	4 6 24.8	13.2	7.5	0.50	29	6 39.4	13 13 20.45	8 28 3.1	9.4	5.4	0.36
15	9 9.0	12 46 0.76	4 6 40.3	13.1	7.5	0.50	30	6 36.9	13 14 44.45	8 37 54.9	9.4	5.4	0.36
16	9 4.7	12 45 40.41	−4 7 13.4	13.0	7.4	0.50	July 1	6 34.4	13 16 10.03	−8 47 53.3	9.3	5.3	0.36
17	9 0.5	12 45 23.07	−4 8 4.1	12.9	7.4	0.49	2	6 31.9	13 17 37.17	−8 57 58.1	9.2	5.3	0.35

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Polar Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Polar Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Mar. 1	17 33.5	16 16 6.10	−20 20 41.4	1.7	18.1	1.37	Apr. 15	14 35.1	16 14 40.77	−20 13 32.9	1.9	20.6	1.56
2	17 29.8	16 16 21.06	20 21 12.9	1.7	18.2	1.38	16	14 30.9	16 14 21.76	20 12 42.6	1.9	20.7	1.57
3	17 26.1	16 16 35.29	20 21 42.4	1.7	18.2	1.38	17	14 26.7	16 14 2.10	20 11 50.7	2.0	20.7	1.57
4	17 22.4	16 16 48.78	20 22 10.1	1.7	18.3	1.39	18	14 22.4	16 13 41.81	20 10 57.2	2.0	20.8	1.57
5	17 18.7	16 17 1.52	20 22 35.8	1.7	18.3	1.39	19	14 18.1	16 13 20.90	20 10 2.2	2.0	20.8	1.57
6	17 14.9	16 17 13.52	−20 22 59.6	1.7	18.4	1.39	20	14 13.8	16 12 59.40	−20 9 5.6	2.0	20.9	1.58
7	17 11.2	16 17 24.77	20 23 21.5	1.7	18.5	1.40	21	14 9.5	16 12 37.31	20 8 7.5	2.0	20.9	1.58
8	17 7.5	16 17 35.26	20 23 41.5	1.7	18.5	1.40	22	14 5.2	16 12 14.64	20 7 8.0	2.0	21.0	1.58
9	17 3.7	16 17 44.97	20 23 59.6	1.7	18.6	1.41	23	14 0.9	16 11 51.40	20 6 7.0	2.0	21.0	1.59
10	16 59.9	16 17 53.92	20 24 15.8	1.8	18.7	1.41	24	13 56.5	16 11 27.61	20 5 4.5	2.0	21.0	1.59
11	16 56.1	16 18 2.10	−20 24 30.1	1.8	18.7	1.42	25	13 52.2	16 11 3.30	−20 4 0.8	2.0	21.0	1.59
12	16 52.3	16 18 9.51	20 24 42.5	1.8	18.8	1.42	26	13 47.9	16 10 38.46	20 2 55.6	2.0	21.1	1.60
13	16 48.5	16 18 16.14	20 24 53.0	1.8	18.8	1.43	27	13 43.5	16 10 13.12	20 1 49.1	2.0	21.1	1.60
14	16 44.6	16 18 21.99	20 25 1.6	1.8	18.9	1.43	28	13 39.2	16 9 47.29	20 0 41.4	2.0	21.1	1.60
15	16 40.8	16 18 27.05	20 25 8.3	1.8	18.9	1.43	29	13 34.8	16 9 20.99	19 59 32.2	2.0	21.2	1.61
16	16 37.0	16 18 31.33	−20 25 13.2	1.8	19.0	1.44	30	13 30.4	16 8 54.23	−19 58 21.8	2.0	21.2	1.61
17	16 33.1	16 18 34.83	20 25 16.1	1.8	19.1	1.44	May 1	13 26.0	16 8 27.02	19 57 10.2	2.0	21.2	1.61
18	16 29.2	16 18 37.54	20 25 17.3	1.8	19.1	1.45	2	13 21.6	16 7 59.40	19 55 57.5	2.0	21.3	1.61
19	16 25.3	16 18 39.47	20 25 16.5	1.8	19.2	1.45	3	13 17.2	16 7 31.37	19 54 43.6	2.0	21.3	1.61
20	16 21.4	16 18 40.62	20 25 13.9	1.8	19.2	1.46	4	13 12.8	16 7 2.95	19 53 28.6	2.0	21.4	1.61
21	16 17.4	16 18 40.98	−20 25 9.4	1.8	19.3	1.46	5	13 8.4	16 6 34.17	−19 52 12.4	2.0	21.4	1.62
22	16 13.5	16 18 40.56	20 25 3.1	1.8	19.3	1.46	6	13 4.0	16 6 5.04	19 50 55.3	2.0	21.4	1.62
23	16 9.6	16 18 39.35	20 24 54.9	1.8	19.4	1.47	7	12 59.6	16 5 35 59	19 49 37.2	2.0	21.5	1.62
24	16 5.6	16 18 37.36	20 24 44.9	1.8	19.5	1.47	8	12 55.2	16 5 5.82	19 48 18.1	2.0	21.5	1.62
25	16 1.6	16 18 34.59	20 24 33.1	1.8	19.5	1.48	9	12 50.7	16 4 35.78	19 46 58.2	2.0	21.5	1.62
26	15 57.6	16 18 31.04	−20 24 19.5	1.8	19.6	1.48	10	12 46.3	16 4 5.47	−19 45 37.5	2.0	21.5	1.62
27	15 53.6	16 18 26.71	20 24 4.1	1.9	19.6	1.48	11	12 41.9	16 3 34.91	19 44 16.0	2.0	21.5	1.62
28	15 49.6	16 18 21.61	20 23 46.8	1.9	19.7	1.49	12	12 37.4	16 3 4.14	19 42 53.8	2.0	21.6	1.62
29	15 45.5	16 18 15.73	20 23 27.8	1.9	19.8	1.49	13	12 33.0	16 2 33.17	19 41 30.9	2.0	21.6	1.63
30	15 41.5	16 18 9.08	20 23 6.9	1.9	19.8	1.50	14	12 28.5	16 2 2.03	19 40 7.4	2.0	21.6	1.63
31	15 37.4	16 18 1.65	−20 22 44.2	1.9	19.9	1.50	15	12 24.1	16 1 30.74	−19 38 43.3	2.0	21.6	1.63
Apr. 1	15 33.4	16 17 53.46	20 22 19.8	1.9	19.9	1.51	16	12 19.6	16 0 59.32	19 37 18.8	2.0	21.6	1.63
2	15 29.3	16 17 44.49	20 21 53.5	1.9	20.0	1.51	17	12 15.2	16 0 27.80	19 35 53.8	2.0	21.6	1.63
3	15 25.2	16 17 34.76	20 21 25.5	1.9	20.1	1.52	18	12 10.7	15 59 56.19	19 34 28.4	2.0	21.6	1.63
4	15 21.1	16 17 24.28	20 20 55.7	1.9	20.1	1.52	19	12 6.3	15 59 24.52	19 33 2.8	2.0	21.6	1.63
5	15 17.0	16 17 13.05	−20 20 24.2	1.9	20.2	1.53	20	12 1.8	15 58 52.80	−19 31 36.9	2.0	21.6	1.63
6	15 12.9	16 17 1.06	20 19 50.8	1.9	20.2	1.53	21	11 57.3	15 58 21.07	19 30 10.8	2.0	21.6	1.63
7	15 8.7	16 16 48.33	20 19 15.7	1.9	20.2	1.53	22	11 52.9	15 57 49.34	19 28 44.7	2.0	21.6	1.63
8	15 4.6	16 16 34.86	20 18 38.8	1.9	20.3	1.54	23	11 48.4	15 57 17.63	19 27 18.4	2.0	21.6	1.63
9	15 0.4	16 16 20.68	20 18 0.2	1.9	20.3	1.54	24	11 43.9	15 56 45.97	19 25 52.1	2.0	21.6	1.63
10	14 56.2	16 16 5.77	−20 17 19.9	1.9	20.4	1.54	25	11 39.5	15 56 14.37	−19 24 25.9	2.0	21.6	1.63
11	14 52.0	16 15 50.14	20 16 37.8	1.9	20.4	1.55	26	11 35.0	15 55 42.86	19 22 59.9	2.0	21.6	1.63
12	14 47.8	16 15 33.82	20 15 54.1	1.9	20.5	1.55	27	11 30.6	15 55 11.45	19 21 34.0	2.0	21.6	1.63
13	14 43.5	16 15 16.81	20 15 8.7	1.9	20.5	1.56	28	11 26.1	15 54 40.17	19 20 8.3	2.0	21.6	1.63
14	14 39.3	16 14 59.12	20 14 21.6	1.9	20.6	1.56	29	11 21.7	15 54 9.04	19 18 43.0	2.0	21.6	1.63
15	14 35.1	16 14 40.77	−20 13 32.9	1.9	20.6	1.56	30	11 17.2	15 53 38.07	−19 17 18.1	2.0	21.6	1.62
16	14 30.9	16 14 21.76	−20 12 42.6	1.9	20.7	1.57	31	11 12.8	15 53 7.20	−19 15 53.5	2.0	21.6	1.62

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Polar Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Polar Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
June 1	11 8.3	15 52 36.73	−19 14 29.5	2.0	21.6	1.62	July 17	7 52.7	15 37 44.81	−18 36 25.0	1.9	19.8	1.48
2	11 3.9	15 52 6.40	19 13 6.0	2.0	21.6	1.62	18	7 48.7	15 37 40.78	18 36 26.0	1.8	19.8	1.48
3	10 59.5	15 51 36.32	19 11 43.2	2.0	21.6	1.62	19	7 44.7	15 37 37.51	18 36 29.5	1.8	19.7	1.48
4	10 55.0	15 51 6.50	19 10 21.1	2.0	21.5	1.62	20	7 40.7	15 37 34.98	18 36 35.6	1.8	19.6	1.47
5	10 50.6	15 50 36.98	19 8 59.7	2.0	21.5	1.62	21	7 36.7	15 37 33.19	18 36 44.2	1.8	19.6	1.47
6	10 46.2	15 50 7.76	−19 7 39.3	2.0	21.5	1.61	22	7 32.8	15 37 32.15	−18 36 55.3	1.8	19.5	1.46
7	10 41.8	15 49 38.88	19 6 19.8	2.0	21.5	1.61	23	7 28.8	15 37 31.85	18 37 9.0	1.8	19.5	1.46
8	10 37.4	15 49 10.35	19 5 1.2	2.0	21.5	1.61	24	7 24.9	15 37 32.30	18 37 25.2	1.8	19.4	1.46
9	10 33.0	15 48 42.21	19 3 43.8	2.0	21.4	1.61	25	7 21.0	15 37 33.49	18 37 43.8	1.8	19.4	1.45
10	10 28.6	15 48 14.44	19 2 27.4	2.0	21.4	1.61	26	7 17.1	15 37 35.43	18 38 4.9	1.8	19.3	1.45
11	10 24.2	15 47 47.08	−19 1 12.2	2.0	21.4	1.60	27	7 13.2	15 37 38.11	−18 38 28.6	1.8	19.3	1.44
12	10 19.8	15 47 20.15	18 59 58.3	2.0	21.4	1.60	28	7 9.4	15 37 41.52	18 38 54.7	1.8	19.2	1.44
13	10 15.4	15 46 53.67	18 58 45.6	2.0	21.3	1.60	29	7 5.5	15 37 45.68	18 39 23.3	1.8	19.2	1.43
14	10 11.1	15 46 27.65	18 57 34.3	2.0	21.3	1.60	30	7 1.6	15 37 50.58	18 39 54.3	1.8	19.1	1.43
15	10 6.7	15 46 2.10	18 56 24.5	2.0	21.3	1.60	31	6 57.8	15 37 56.20	18 40 27.7	1.8	19.0	1.43
16	10 2.4	15 45 37.04	−18 55 16.1	2.0	21.2	1.59	Aug. 1	6 54.0	15 38 2.57	−18 41 3.7	1.8	19.0	1.42
17	9 58.0	15 45 12.50	18 54 9.3	2.0	21.2	1.59	2	6 50.2	15 38 9.66	18 41 42.0	1.8	18.9	1.42
18	9 53.7	15 44 48.47	18 53 4.1	2.0	21.2	1.59	3	6 46.4	15 38 17.50	18 42 22.6	1.8	18.9	1.41
19	9 49.4	15 44 24.97	18 52 0.6	2.0	21.2	1.59	4	6 42.6	15 38 26.06	18 43 5.7	1.8	18.8	1.41
20	9 45.1	15 44 2.02	18 50 58.8	2.0	21.1	1.58	5	6 38.8	15 38 35.37	18 43 51.3	1.8	18.8	1.41
21	9 40.8	15 43 39.62	−18 49 58.8	2.0	21.1	1.58	6	6 35.0	15 38 45.40	−18 44 39.2	1.8	18.7	1.40
22	9 36.5	15 43 17.80	18 49 0.6	2.0	21.1	1.58	7	6 31.3	15 38 56.15	18 45 29.4	1.8	18.7	1.40
23	9 32.2	15 42 56.56	18 48 4.3	2.0	21.0	1.57	8	6 27.5	15 39 7.62	18 46 21.9	1.8	18.6	1.39
24	9 27.9	15 42 35.92	18 47 9.8	2.0	21.0	1.57	9	6 23.8	15 39 19.80	18 47 16.8	1.7	18.6	1.39
25	9 23.7	15 42 15.87	18 46 17.4	2.0	20.9	1.57	10	6 20.1	15 39 32.70	18 48 13.8	1.7	18.5	1.39
26	9 19.4	15 41 56.43	−18 45 26.9	2.0	20.9	1.56	11	6 16.4	15 39 46.31	−18 49 13.1	1.7	18.5	1.38
27	9 15.2	15 41 37.61	18 44 38.4	2.0	20.8	1.56	12	6 12.7	15 40 0.62	18 50 14.6	1.7	18.4	1.38
28	9 10.9	15 41 19.42	18 43 51.9	2.0	20.8	1.56	13	6 9.0	15 40 15.64	18 51 18.4	1.7	18.3	1.38
29	9 6.7	15 41 1.88	18 43 7.6	1.9	20.7	1.55	14	6 5.3	15 40 31.35	18 52 24.2	1.7	18.3	1.37
30	9 2.5	15 40 44.99	18 42 25.3	1.9	20.7	1.55	15	6 1.7	15 40 47.75	18 53 32.2	1.7	18.2	1.37
July 1	8 58.3	15 40 28.75	−18 41 45.3	1.9	20.6	1.55	16	5 58.0	15 41 4.83	−18 54 42.4	1.7	18.2	1.36
2	8 54.1	15 40 13.19	18 41 7.4	1.9	20.6	1.54	17	5 54.4	15 41 22.58	18 55 54.6	1.7	18.1	1.36
3	8 49.9	15 39 58.30	18 40 31.8	1.9	20.5	1.54	18	5 50.8	15 41 41.01	18 57 8.7	1.7	18.1	1.36
4	8 45.8	15 39 44.11	18 39 58.6	1.9	20.5	1.54	19	5 47.2	15 42 0.11	18 58 24.9	1.7	18.0	1.35
5	8 41.6	15 39 30.60	18 39 27.6	1.9	20.4	1.53	20	5 43.6	15 42 19.87	18 59 43.0	1.7	18.0	1.35
6	8 37.4	15 39 17.80	−18 38 58.9	1.9	20.4	1.53	21	5 40.0	15 42 40.28	−19 1 3.0	1.7	17.9	1.35
7	8 33.3	15 39 5.71	18 38 32.6	1.9	20.3	1.52	22	5 36.4	15 43 1.34	19 2 24.9	1.7	17.9	1.34
8	8 29.2	15 38 54.33	18 38 8.7	1.9	20.3	1.52	23	5 32.8	15 43 23.05	19 3 48.6	1.7	17.8	1.34
9	8 25.1	15 38 43.66	18 37 47.2	1.9	20.2	1.52	24	5 29.2	15 43 45.41	19 5 14.2	1.7	17.8	1.34
10	8 21.0	15 38 33.72	18 37 28.2	1.9	20.2	1.51	25	5 25.7	15 44 8.40	19 6 41.6	1.7	17.7	1.33
11	8 16.9	15 38 24.52	−18 37 11.6	1.9	20.1	1.51	26	5 22.2	15 44 32.03	−19 8 10.7	1.7	17.7	1.33
12	8 12.8	15 38 16.06	18 36 57.6	1.9	20.1	1.50	27	5 18.6	15 44 56.28	19 9 41.5	1.7	17.6	1.32
13	8 8.8	15 38 8.33	18 36 46.1	1.9	20.0	1.50	28	5 15.1	15 45 22.15	19 11 14.0	1.6	17.6	1.32
14	8 4.7	15 38 1.34	18 36 37.0	1.9	20.0	1.50	29	5 11.6	15 45 46.65	19 12 48.2	1.6	17.5	1.31
15	8 0.7	15 37 55.09	18 36 30.5	1.9	19.9	1.49	30	5 8.1	15 46 12.75	19 14 24.0	1.6	17.5	1.31
16	7 56.7	15 37 49.58	−18 36 26.5	1.9	19.9	1.49	31	5 4.6	15 46 39.46	−19 16 1.3	1.6	17.4	1.31
17	7 52.7	15 37 44.81	−18 36 25.0	1.9	19.8	1.48	32	5 1.1	15 47 6.78	−19 17 40.2	1.6	17.4	1.30

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Polar Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Polar Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Jan. 0	13 47.7	8 29 11.33	+19 30 46.7	1.1	9.5	0.72	Feb. 15	10 32.1	8 14 25.95	+20 25 4.2	1.1	9.5	0.73
1	13 43.5	8 28 53.95	19 31 55.6	1.1	9.6	0.72	16	10 27.9	8 14 8.83	20 26 3.1	1.1	9.5	0.72
2	13 39.2	8 28 36.32	19 33 5.2	1.1	9.6	0.72	17	10 23.7	8 13 51.98	20 27 1.1	1.1	9.5	0.72
3	13 35.0	8 28 18.46	19 34 15.5	1.1	9.6	0.72	18	10 19.5	8 13 35.41	20 27 57.9	1.1	9.5	0.72
4	13 30.8	8 28 0.38	19 35 26.4	1.1	9.6	0.72	19	10 15.3	8 13 19.12	20 28 53.7	1.1	9.5	0.72
5	13 26.6	8 27 42.08	+19 36 37.8	1.1	9.6	0.73	20	10 11.1	8 13 3.11	+20 29 48.4	1.1	9.5	0.72
6	13 22.3	8 27 23.57	19 37 49.8	1.1	9.6	0.73	21	10 6.9	8 12 47.40	20 30 42.1	1.1	9.5	0.72
7	13 18.1	8 27 4.87	19 39 2.3	1.1	9.6	0.73	22	10 2.7	8 12 32.01	20 31 34.6	1.1	9.5	0.72
8	13 13.8	8 26 45.99	19 40 15.2	1.1	9.6	0.73	23	9 58.5	8 12 16.93	20 32 25.9	1.1	9.5	0.72
9	13 9.6	8 26 26.94	19 41 28.5	1.1	9.6	0.73	24	9 54.3	8 12 2.17	20 33 16.1	1.1	9.5	0.72
10	13 5.3	8 26 7.72	+19 42 42.2	1.1	9.6	0.73	25	9 50 2	8 11 47.75	+20 34 5.1	1.1	9.4	0.72
11	13 1.1	8 25 48.35	19 43 56.2	1.1	9.6	0.73	26	9 46 0	8 11 33.66	20 34 52.9	1.1	9.4	0.72
12	12 56.8	8 25 28.85	19 45 10.4	1.1	9.6	0.73	27	9 41.8	8 11 19.92	20 35 39.4	1.1	9.4	0.72
13	12 52.6	8 25 9.21	19 46 24.9	1.1	9.6	0.73	28	9 37.7	8 11 6.52	20 36 24.7	1.1	9.4	0.72
14	12 48.3	8 24 49.46	19 47 39.6	1.1	9.6	0.73	29	9 33.5	8 10 53.47	20 37 8.8	1.1	9.4	0.72
15	12 44.0	8 24 29.60	+19 48 54.4	1.1	9.6	0.73	Mar. 1	9 29.4	8 10 40.79	+20 37 51.6	1.1	9.4	0.71
16	12 39.8	8 24 9.65	19 50 9.2	1.1	9.6	0.73	2	9 25.3	8 10 28.48	20 38 33.2	1.1	9.4	0.71
17	12 35.5	8 23 49.62	19 51 24.2	1.1	9.6	0.73	3	9 21.1	8 10 16.55	20 39 13.4	1.1	9.4	0.71
18	12 31.2	8 23 29.53	19 52 39.1	1.1	9.6	0.73	4	9 17.0	8 10 4.99	20 39 52.4	1.1	9.3	0.71
19	12 27.0	8 23 9.38	19 53 54.0	1.1	9.6	0.73	5	9 12.9	8 9 53.83	20 40 30.1	1.1	9.3	0.71
20	12 22.7	8 22 49.19	+19 55 8.9	1.1	9.6	0.73	6	9 8.8	8 9 43.06	+20 41 6.5	1.1	9.3	0.71
21	12 18.4	8 22 28.97	19 56 23.6	1.1	9.6	0.73	7	9 4.7	8 9 32.69	20 41 41.5	1.1	9.3	0.71
22	12 14.2	8 22 8.72	19 57 38.2	1.1	9.6	0.73	8	9 0.6	8 9 22.72	20 42 15.2	1.1	9.3	0.71
23	12 9.9	8 21 48.47	19 58 52.5	1.1	9.6	0.73	9	8 56.5	8 9 13.16	20 42 47.5	1.1	9.3	0.71
24	12 5.6	8 21 28.21	20 0 6.7	1.1	9.6	0.73	10	8 52.4	8 9 4.01	20 43 18.5	1.0	9.3	0.71
25	12 1.4	8 21 7.98	+20 1 20.6	1.1	9.6	0.73	11	8 48.3	8 8 55.29	+20 43 48.1	1.0	9.2	0.70
26	11 57.1	8 20 47.75	20 2 34.1	1.1	9.6	0.73	12	8 44.3	8 8 46.98	20 44 16.3	1.0	9.2	0.70
27	11 52.8	8 20 27.57	20 3 47.3	1.1	9.6	0.73	13	8 40.2	8 8 39.12	20 44 43.2	1.0	9.2	0.70
28	11 48.6	8 20 7.45	20 5 0.2	1.1	9.6	0.73	14	8 36.1	8 8 31.68	20 45 8.6	1.0	9.2	0.70
29	11 44.3	8 19 47.38	20 6 12.5	1.1	9.6	0.73	15	8 32.1	8 8 24.68	20 45 32.7	1.0	9.2	0.70
30	11 40.0	8 19 27.38	+20 7 24.4	1.1	9.6	0.73	16	8 28.0	8 8 18.12	+20 45 55.4	1.0	9.2	0.70
31	11 35.8	8 19 7.47	20 8 35.8	1.1	9.6	0.73	17	8 24.0	8 8 12.00	20 46 16.6	1.0	9.2	0.70
Feb. 1	11 31.5	8 18 47.65	20 9 46.7	1.1	9.6	0.73	18	8 20.0	8 8 6.33	20 46 36.5	1.0	9.1	0.70
2	11 27.3	8 18 27.92	20 10 57.0	1.1	9.6	0.73	19	8 16.0	8 8 1.10	20 46 54.9	1.0	9.1	0.70
3	11 23.0	8 18 8.31	20 12 6.7	1.1	9.6	0.73	20	8 12.0	8 7 56.32	20 47 11.9	1.0	9.1	0.69
4	11 18.7	8 17 48.83	+20 13 15.8	1.1	9.6	0.73	21	8 7.9	8 7 51.98	+20 47 27.6	1.0	9.1	0.69
5	11 14.5	8 17 29.48	20 14 24.2	1.1	9.6	0.73	22	8 3.9	8 7 48.10	20 47 41.8	1.0	9.1	0.69
6	11 10.2	8 17 10.27	20 15 31.9	1.1	9.6	0.73	23	8 0.0	8 7 44.67	20 47 54.6	1.0	9.1	0.69
7	11 6.0	8 16 51.23	20 16 38.8	1.1	9.6	0.73	24	7 56.0	8 7 41.69	20 48 6.0	1.0	9.0	0.69
8	11 1.7	8 16 32.36	20 17 45.0	1.1	9.6	0.73	25	7 52.0	8 7 39.17	20 48 16.0	1.0	9.0	0.69
9	10 57.5	8 16 13.67	+20 18 50.4	1.1	9.6	0.73	26	7 48.0	8 7 37.10	+20 48 24.6	1.0	9.0	0.69
10	10 53.3	8 15 55.18	20 19 55.0	1.1	9.6	0.73	27	7 44.1	8 7 35.49	20 48 31.8	1.0	9.0	0.69
11	10 49.0	8 15 36.89	20 20 58.7	1.1	9.6	0.73	28	7 40.1	8 7 34.33	20 48 37.5	1.0	9.0	0.68
12	10 44.8	8 15 18 81	20 22 1.4	1.1	9.6	0.73	29	7 36.2	8 7 33.63	20 48 41.8	1.0	9.0	0.68
13	10 40.6	8 15 0.95	20 23 3.3	1.1	9.6	0.73	30	7 32.3	8 7 33.38	20 48 44.8	1.0	9.0	0.68
14	10 36.3	8 14 43.33	+20 24 4.2	1.1	9.5	0.73	31	7 28.3	8 7 33.59	+20 48 46.3	1.0	9.0	0.68
15	10 32.1	8 14 25.95	+20 25 4.2	1.1	9.5	0.73	Apr. 1	7 24.4	8 7 34.25	+20 48 46.4	1.0	8.9	0.68

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Polar Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Polar Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Apr. 1	7 24.4	8 7 34.25	+20 48 46.4	1.0	8.9	0.68	Nov. 16	17 43.9	9 31 34.87	+15 38 11.2	1.0	8.7	0.64
2	7 20.5	8 7 35.37	20 48 45.1	1.0	8.9	0.68	17	17 40.0	9 31 40.79	15 37 54.7	1.0	8.7	0.64
3	7 16.6	8 7 36.94	20 48 42.4	1.0	8.9	0.68	18	17 36.2	9 31 46.29	15 37 40.2	1.0	8.7	0.64
4	7 12.7	8 7 38.97	20 48 38.3	1.0	8.9	0.68	19	17 32.4	9 31 51.36	15 37 27.9	1.0	8.7	0.65
5	7 8.8	8 7 41.46	20 48 32.8	1.0	8.9	0.68	20	17 28.5	9 31 55.99	15 37 17.7	1.0	8.7	0.65
6	7 4.9	8 7 44.41	+20 48 25.9	1.0	8.9	0.67	21	17 24.6	9 32 0.19	+15 37 9.6	1.0	8.7	0.65
7	7 1.0	8 7 47.80	20 48 17.6	1.0	8.8	0.67	22	17 20.8	9 32 3.95	15 37 3.7	1.0	8.8	0.65
8	6 57.2	8 7 51.65	20 48 7.9	1.0	8.8	0.67	23	17 16.9	9 32 7.28	15 36 59.8	1.0	8.8	0.65
9	6 53.3	8 7 55.96	20 47 56.8	1.0	8.8	0.67	24	17 13.0	9 32 10.17	15 36 58.2	1.0	8.8	0.65
10	6 49.4	8 8 0.71	20 47 44.3	1.0	8.8	0.67	25	17 9.1	9 32 12.62	15 36 58.7	1.0	8.8	0.65
11	6 45.6	8 8 5.92	+20 47 30.4	1.0	8.8	0.67	26	17 5.2	9 32 14.63	+15 37 1.3	1.0	8.8	0.65
12	6 41.8	8 8 11.58	20 47 15.1	1.0	8.7	0.67	27	17 1.3	9 32 16.20	15 37 6.0	1.0	8.8	0.65
13	6 37.9	8 8 17.68	20 46 58.4	1.0	8.7	0.67	28	16 57.4	9 32 17.33	15 37 12.9	1.0	8.9	0.66
14	6 34.1	8 8 24.23	20 46 40.4	1.0	8.7	0.66	29	16 53.5	9 32 18.01	15 37 22.0	1.0	8.9	0.66
15	6 30.3	8 8 31.22	20 46 21.0	1.0	8.7	0.66	30	16 49.6	9 32 18.24	15 37 33.2	1.0	8.9	0.66
16	6 26.5	8 8 38.65	+20 46 0.2	1.0	8.7	0.66	Dec. 1	16 45.6	9 32 18.03	+15 37 46.6	1.0	8.9	0.66
17	6 22.7	8 8 46.52	20 45 38.1	1.0	8.7	0.66	2	16 41.7	9 32 17.38	15 38 2.1	1.0	8.9	0.66
18	6 18.9	8 8 54.82	20 45 14.7	1.0	8.6	0.66	3	16 37.7	9 32 16.29	15 38 19.8	1.0	8.9	0.66
19	6 15.1	8 9 3.55	20 44 49.9	1.0	8.6	0.66	4	16 33.8	9 32 14.75	15 38 39.6	1.0	8.9	0.66
20	6 11.3	8 9 12.71	20 44 23.7	1.0	8.6	0.66	5	16 29.8	9 32 12.78	15 39 1.5	1.0	9.0	0.66
21	6 7.6	8 9 22.29	+20 43 56.2	1.0	8.6	0.66	6	16 25.8	9 32 10.36	+15 39 25.6	1.0	9.0	0.67
22	6 3.8	8 9 32.30	20 43 27.4	1.0	8.6	0.65	7	16 21.8	9 32 7.50	15 39 51.8	1.0	9.0	0.67
23	6 0.1	8 9 42.72	20 42 57.2	1.0	8.6	0.65	8	16 17.9	9 32 4.21	15 40 20.0	1.0	9.0	0.67
24	5 56.3	8 9 53.56	20 42 25.7	1.0	8.6	0.65	9	16 13.9	9 32 0.48	15 40 50.3	1.0	9.0	0.67
25	5 52.6	8 10 4.80	20 41 53.0	1.0	8.5	0.65	10	16 9.9	9 31 56.33	15 41 22.7	1.0	9.0	0.67
26	5 48.8	8 10 16.45	+20 41 18.9	1.0	8.5	0.65	11	16 5.9	9 31 51.74	+15 41 57.2	1.0	9.1	0.67
27	5 45.1	8 10 28.51	20 40 43.5	1.0	8.5	0.65	12	16 1.8	9 31 46.73	15 42 33.7	1.0	9.1	0.67
28	5 41.4	8 10 40.97	20 40 6.9	1.0	8.5	0.65	13	15 57.8	9 31 41.29	15 43 12.1	1.0	9.1	0.67
29	5 37.6	8 10 53.82	20 39 28.9	1.0	8.5	0.65	14	15 53.8	9 31 35.43	15 43 52.6	1.0	9.1	0.68
30	5 33.9	8 11 7.07	20 38 49.6	1.0	8.5	0.64	15	15 49.8	9 31 29.16	15 44 35.1	1.0	9.1	0.68
Nov. 1	18 40.5	9 29 15.82	+15 46 23.6	1.0	8.4	0.62	16	15 45.7	9 31 22.47	+15 45 19.5	1.0	9.1	0.68
2	18 36.8	9 29 27.94	15 45 36.9	1.0	8.4	0.63	17	15 41.7	9 31 15.36	15 46 5.8	1.0	9.2	0.68
3	18 33.1	9 29 39.67	15 44 52.2	1.0	8.5	0.63	18	15 37.6	9 31 7.84	15 46 54.1	1.0	9.2	0.68
4	18 29.3	9 29 51.00	15 44 9.3	1.0	8.5	0.63	19	15 33.5	9 30 59.93	15 47 44.3	1.0	9.2	0.68
5	18 25.6	9 30 1.92	15 43 28.5	1.0	8.5	0.63	20	15 29.5	9 30 51.61	15 48 36.3	1.0	9.2	0.68
6	18 21.8	9 30 12.44	+15 42 49.6	1.0	8 5	0.63	21	15 25.4	9 30 42.88	+15 49 30.2	1.0	9.2	0.68
7	18 18.1	9 30 22.56	15 42 12.6	1.0	8.5	0.63	22	15 21.3	9 30 33.77	15 50 25.9	1.0	9.2	0.68
8	18 14.3	9 30 32.26	15 41 37.7	1.0	8.5	0.63	23	15 17.2	9 30 24.26	15 51 23.4	1.0	9.2	0.68
9	18 10.5	9 30 41.55	15 41 4.7	1.0	8.5	0.63	24	15 13.1	9 30 14.36	15 52 22.6	1.0	9.3	0.69
10	18 6.7	9 30 50.42	15 40 33.8	1.0	8.6	0.63	25	15 9.0	9 30 4.08	15 53 23.6	1.0	9.3	0.69
11	18 2.9	9 30 58.88	+15 40 4.9	1.0	8.6	0.64	26	15 4.9	9 29 53.41	+15 54 26.3	1.0	9.3	0.69
12	17 59.1	9 31 6.92	15 39 38.1	1.0	8.6	0.64	27	15 0.8	9 29 42.37	15 55 30.7	1.0	9.3	0.69
13	17 55.3	9 31 14.54	15 39 13.3	1.0	8.6	0.64	28	14 56.7	9 29 30.97	15 56 36.7	1.0	9.3	0.69
14	17 51.5	9 31 21.74	15 38 50.5	1.0	8.6	0.64	29	14 52.6	9 29 19.20	15 57 44.3	1.0	9.3	0.69
15	17 47.7	9 31 28.52	15 38 29.8	1.0	8.7	0.64	30	14 48.4	9 29 7.08	15 58 53.5	1.1	9.3	0.69
16	17 43.9	9 31 34.87	+15 38 11.2	1.0	8.7	0.64	31	14 44.3	9 28 54.60	+16 0 4.2	1.1	9.3	0.69
17	17 40.0	9 31 40.79	+15 37 54.7	1.0	8.7	0.64	32	14 40.1	9 28 41.77	+16 1 16.5	1.1	9.4	0.69

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T.of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Jan. 1	18 17.8	13 3 57.44	−6 5 47.3	0.5	1.8	0.12	Feb. 15	15 20.4	13 3 33.06	−6 1 47.8	0.5	1.9	0.13
2	18 13.9	13 4 1.42	6 6 9.8	0.5	1.8	0.12	16	15 16.4	13 3 28.02	6 1 15.0	0.5	1.9	0.13
3	18 10.0	13 4 5.19	6 6 31.1	0.5	1.8	0.12	17	15 12.4	13 3 22.80	6 0 41.1	0.5	1.9	0.13
4	18 6.2	13 4 8.76	6 6 51.1	0.5	1.8	0.12	18	15 8.4	13 3 17.42	6 0 6.3	0.5	1.9	0.13
5	18 2.3	13 4 12.13	6 7 9.8	0.5	1.8	0.12	19	15 4.4	13 3 11.87	5 59 30.4	0.5	1.9	0.13
6	17 58.4	13 4 15.29	−6 7 27.2	0.5	1.8	0.12	20	15 0.4	13 3 6.16	−5 58 53.6	0.5	1.9	0.13
7	17 54.5	13 4 18.25	6 7 43.3	0.5	1.8	0.12	21	14 56.3	13 3 0.28	5 58 15.8	0.5	1.9	0.13
8	17 50.7	13 4 21.00	6 7 58.2	0.5	1.8	0.12	22	14 52.3	13 2 54.25	5 57 37.0	0.5	1.9	0.13
9	17 46.8	13 4 23.54	6 8 11.8	0.5	1.8	0.12	23	14 48.3	13 2 48.06	5 56 57.3	0.5	1.9	0.13
10	17 42.9	13 4 25.87	6 8 24.1	0.5	1.8	0.12	24	14 44.2	13 2 41.72	5 56 16.7	0.5	1.9	0.13
11	17 39.0	13 4 27.99	−6 8 35.1	0.5	1.8	0.12	25	14 40.2	13 2 35.23	−5 55 35.1	0.5	1.9	0.13
12	17 35.1	13 4 29.91	6 8 44.8	0.5	1.8	0.12	26	14 36.1	13 2 28.59	5 54 52.7	0.5	1.9	0.13
13	17 31.2	13 4 31.61	6 8 53.2	0.5	1.8	0.12	27	14 32.1	13 2 21.81	5 54 9.5	0.5	1.9	0.13
14	17 27.3	13 4 33.10	6 9 0.3	0.5	1.8	0.12	28	14 28.0	13 2 14.89	5 53 25.4	0.5	1.9	0.13
15	17 23.4	13 4 34.38	6 9 6.1	0.5	1.8	0.12	29	14 24.0	13 2 7.83	5 52 40.4	0.5	1 9	0.13
16	17 19.4	13 4 35.45	−6 9 10.7	0.5	1.8	0.12	Mar. 1	14 19.9	13 2 0.63	−5 51 54.7	0.5	1.9	0.13
17	17 15.5	13 4 36.31	6 9 13.9	0.5	1.8	0.12	2	14 15.9	13 1 53.31	5 51 8.2	0.5	1.9	0.13
18	17 11.6	13 4 36.96	6 9 15.8	0.5	1.8	0.12	3	14 11.9	13 1 45.85	5 50 20.9	0.5	1.9	0.13
19	17 7.7	13 4 37.41	6 9 16.5	0.5	1.8	0.12	4	14 7.8	13 1 38.27	5 49 32.8	0.5	1.9	0.13
20	17 3.7	13 4 37.64	6 9 15.9	0.5	1.8	0.12	5	14 3.7	13 1 30.56	5 48 44.0	0.5	1.9	0.13
21	16 59.8	13 4 37.67	−6 9 14.0	0.5	1.9	0.12	6	13 59.6	13 1 22.74	−5 47 54.5	0.5	1.9	0.13
22	16 55.9	13 4 37.48	6 9 10.8	0.5	1.9	0.12	7	13 55.6	13 1 14.80	5 47 4.4	0.5	1.9	0.13
23	16 51.9	13 4 37.09	6 9 6.3	0.5	1.9	0.12	8	13 51.5	13 1 6.75	5 46 13.5	0.5	1.9	0.13
24	16 48.0	13 4 36.50	6 9 0.6	0.5	1.9	0.12	9	13 47.4	13 0 58.59	5 45 22.1	0.5	1.9	0.13
25	16 44.1	13 4 35.70	6 8 53.6	0.5	1.9	0.12	10	13 43.4	13 0 50.32	5 44 30.0	0.5	1.9	0.13
26	16 40.1	13 4 34.69	−6 8 45.4	0.5	1.9	0.12	11	13 39.3	13 0 41.96	−5 43 37.3	0.5	1.9	0.13
27	16 36.2	13 4 33.48	6 8 35.9	0.5	1.9	0.12	12	13 35.2	13 0 33.50	5 42 43.9	0.5	1.9	0.13
28	16 32.2	13 4 32.07	6 8 25.2	0.5	1.9	0.12	13	13 31.2	13 0 24.94	5 41 50.1	0.5	1.9	0.13
29	16 28.2	13 4 30.46	6 8 13.2	0.5	1.9	0.13	14	13 27.1	13 0 16.29	5 40 55.8	0.5	1.9	0.13
30	16 24.3	13 4 28.64	6 8 0.0	0.5	1.9	0.13	15	13 23.0	13 0 7.57	5 40 1.0	0.5	1.9	0.13
31	16 20.3	13 4 26.62	−6 7 45.6	0.5	1.9	0.13	16	13 18.9	12 59 58.76	−5 39 5.6	0.5	1.9	0.13
Feb. 1	16 16.3	13 4 24.40	6 7 30.0	0.5	1.9	0.13	17	13 14.9	12 59 49.87	5 38 9.8	0.5	1.9	0.13
2	16 12.4	13 4 21.99	6 7 13.1	0.5	1.9	0.13	18	13 10.8	12 59 40.91	5 37 13.7	0.5	1.9	0.13
3	16 8.4	13 4 19.37	6 6 55.0	0.5	1.9	0.13	19	13 6.7	12 59 31.89	5 36 17.1	0.5	1.9	0.13
4	16 4.4	13 4 16.56	6 6 35.8	0.5	1.9	0.13	20	13 2.6	12 59 22.79	5 35 20.2	0.5	1.9	0.13
5	16 0.4	13 4 13.55	−6 6 15.4	0.5	1.9	0.13	21	12 58.5	12 59 13.64	−5 34 22.9	0.5	1.9	0.13
6	15 56.5	13 4 10.34	6 5 53.7	0.5	1.9	0.13	22	12 54.4	12 59 4.44	5 33 25.3	0.5	1.9	0.13
7	15 52.5	13 4 6.95	6 5 30.9	0.5	1.9	0.13	23	12 50.3	12 58 55.19	5 32 27.5	0.5	1.9	0.13
8	15 48.5	13 4 3.37	6 5 7.0	0.5	1.9	0.13	24	12 46.3	12 58 45.88	5 31 29.3	0.5	1.9	0.13
9	15 44.5	13 3 59.59	6 4 41.9	0.5	1.9	0.13	25	12 42.2	12 58 36.53	5 30 30.9	0.5	1.9	0.13
10	15 40.5	13 3 55.62	−6 4 15.6	0.5	1.9	0.13	26	12 38.1	12 58 27.15	−5 29 32.4	0.5	1.9	0.13
11	15 36.5	13 3 51.47	6 3 48.3	0.5	1.9	0.13	27	12 34.0	12 58 17.73	5 28 33.6	0.5	1.9	0.13
12	15 32.5	13 3 47.14	6 3 19.8	0.5	1.9	0.13	28	12 29.9	12 58 8.27	5 27 34.7	0.5	1.9	0.13
13	15 28.5	13 3 42.63	6 2 50.2	0.5	1.9	0.13	29	12 25.8	12 57 58.78	5 26 35.6	0.5	1.9	0.13
14	15 24.5	13 3 37.93	6 2 19.5	0.5	1.9	0.13	30	12 21.8	12 57 49.28	5 25 36.4	0.5	1.9	0.13
15	15 20.4	13 3 33.06	−6 1 47.8	0.5	1.9	0.13	31	12 17.7	12 57 39.75	−5 24 37.1	0.5	1.9	0.13
16	15 16.4	13 3 28.02	−6 1 15.0	0.5	1.9	0.13	Apr. 1	12 13.5	12 57 30.21	−5 23 37.8	0.5	1.9	0.13

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi diam.	S.T. of Sem. Pass Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Apr. 1	12 13.5	12 57 30.21	−5 23 37.8	0.5	1.9	0.13	May 16	9 10.3	12 51 9.59	−4 44 46.3	0.5	1.9	0.13
2	12 9.5	12 57 20.65	5 22 38.4	0.5	1.9	0.13	17	9 6.3	12 51 3.52	4 44 10.2	0.5	1.9	0.13
3	12 5.4	12 57 11.09	5 21 39.0	0.5	1.9	0.13	18	9 2.2	12 50 57.60	4 43 35.0	0.5	1.9	0.13
4	12 1.3	12 57 1.52	5 20 39.6	0.5	1.9	0.13	19	8 58.2	12 50 51.83	4 43 0.8	0.5	1.9	0.13
5	11 57.2	12 56 51.95	5 19 40.2	0.5	1.9	0.13	20	8 54.2	12 50 46.22	4 42 27.6	0.5	1.9	0.13
6	11 53.1	12 56 42.39	−5 18 40.9	0.5	1.9	0.13	21	8 50.2	12 50 40.77	−4 41 55.5	0.5	1.9	0.13
7	11 49.0	12 56 32.84	5 17 41.7	0.5	1.9	0.13	22	8 46.1	12 50 35.48	4 41 24.4	0.5	1.9	0.13
8	11 44.9	12 56 23.30	5 16 42.6	0.5	1.9	0.13	23	8 42.1	12 50 30.35	4 40 54.3	0.5	1.9	0.13
9	11 40.8	12 56 13.78	5 15 43.6	0.5	1.9	0.13	24	8 38.1	12 50 25.38	4 40 25.2	0.5	1.9	0.13
10	11 36.7	12 56 4.27	5 14 44.9	0.5	1.9	0.13	25	8 34.1	12 50 20.57	4 39 57.3	0.5	1.9	0.13
11	11 32.6	12 55 54.80	−5 13 46.3	0.5	1.9	0.13	26	8 30.1	12 50 15.94	−4 39 30.4	0.5	1.9	0.13
12	11 28.5	12 55 45.36	5 12 48.0	0.5	1.9	0.13	27	8 26.1	12 50 11.47	4 39 4.6	0.5	1.9	0.13
13	11 24.5	12 55 35.95	5 11 49.8	0.5	1.9	0.13	28	8 22.1	12 50 7.17	4 38 39.8	0.5	1.9	0.13
14	11 20.4	12 55 26.58	5 10 51.9	0.5	1.9	0.13	29	8 18.1	12 50 3.04	4 38 16.2	0.5	1.9	0.13
15	11 16.3	12 55 17.26	5 9 54.4	0.5	1.9	0.13	30	8 14.1	12 49 59.09	4 37 53.7	0.5	1.9	0.13
16	11 12.2	12 55 7.99	−5 8 57.2	0.5	1.9	0.13	31	8 10.1	12 49 55.31	−4 37 32.3	0.5	1.9	0.13
17	11 8.1	12 54 58.76	5 8 0.4	0.5	1.9	0.13	June 1	8 6.1	12 49 51.70	4 37 12.1	0.5	1.9	0.13
18	11 4.1	12 54 49.59	5 7 3.9	0.5	1.9	0.13	2	8 2.1	12 49 48.28	4 36 52.9	0.5	1.9	0.13
19	11 0.0	12 54 40.48	5 6 7.9	0.5	1.9	0.13	3	7 58.1	12 49 45.04	4 36 35.0	0.5	1.9	0.13
20	10 55.9	12 54 31.44	5 5 12.3	0.5	1.9	0.13	4	7 54.1	12 49 41.98	4 36 18.1	0.5	1.9	0.13
21	10 51.8	12 54 22.45	−5 4 17.1	0.5	1.9	0.13	5	7 50.2	12 49 39.10	−4 36 2.5	0.5	1.9	0.13
22	10 47.7	12 54 13.54	5 3 22.4	0.5	1.9	0.13	6	7 46.2	12 49 36.40	4 35 48.0	0.5	1.9	0.13
23	10 43.6	12 54 4.71	5 2 28.2	0.5	1.9	0.13	7	7 42.2	12 49 33.89	4 35 34.7	0.5	1.9	0.13
24	10 39.6	12 53 55.96	5 1 34.5	0.5	1.9	0.13	8	7 38.2	12 49 31.58	4 35 22.7	0.5	1.9	0.12
25	10 35.5	12 53 47.28	5 0 41.4	0.5	1.9	0.13	9	7 34.3	12 49 29.44	4 35 11.8	0.5	1.9	0.12
26	10 31.4	12 53 38.68	−4 59 48.8	0.5	1.9	0.13	10	7 30.3	12 49 27.50	−4 35 2.1	0.5	1.9	0.12
27	10 27.3	12 53 30.18	4 58 56.8	0.5	1.9	0.13	11	7 26.3	12 49 25.74	4 34 53.6	0.5	1.9	0.12
28	10 23.3	12 53 21.77	4 58 5.4	0.5	1.9	0.13	12	7 22.4	12 49 24.18	4 34 46.3	0.5	1.9	0.12
29	10 19.2	12 53 13.45	4 57 14.6	0.5	1.9	0.13	13	7 18.4	12 49 22.81	4 34 40.3	0.5	1.9	0.12
30	10 15.1	12 53 5.22	4 56 24.5	0 5	1.9	0.13	14	7 14.5	12 49 21.63	4 34 35.5	0.5	1.9	0.12
May 1	10 11.0	12 52 57.10	−4 55 35.0	0.5	1.9	0.13	15	7 10.5	12 49 20.64	−4 34 31.9	0.5	1.9	0.12
2	10 7.0	12 52 49.08	4 54 46.2	0.5	1.9	0.13	16	7 6.6	12 49 19.84	4 34 29.5	0.5	1.9	0.12
3	10 2.9	12 52 41.17	4 53 58.1	0.5	1.9	0.13	17	7 2.6	12 49 19.24	4 34 28.4	0.5	1.9	0.12
4	9 58.9	12 52 33.37	4 53 10.7	0.5	1.9	0.13	18	6 58.7	12 49 18.83	4 34 28.5	0.5	1.9	0.12
5	9 54.8	12 52 25.68	4 52 24.1	0.5	1.9	0.13	19	6 54.8	12 49 18.62	4 34 29.8	0.5	1.9	0.12
6	9 50.7	12 52 18.11	−4 51 38.3	0.5	1.9	0.13	20	6 50.8	12 49 18.60	−4 34 32.3	0.5	1.9	0.12
7	9 46.7	12 52 10.66	4 50 53.3	0.5	1.9	0.13	21	6 46.9	12 49 18.77	4 34 36.1	0.5	1.8	0.12
8	9 42.6	12 52 3.34	4 50 9.0	0.5	1.9	0.13	22	6 43.0	12 49 19.13	4 34 41.0	0.5	1.8	0.12
9	9 38.6	12 51 56.15	4 49 25.6	0.5	1.9	0.13	23	6 39.1	12 49 19.69	4 34 47.2	0.5	1.8	0.12
10	9 34.5	12 51 49.08	4 48 43.0	0.5	1.9	0.13	24	6 35.1	12 49 20.44	4 34 54.7	0.5	1.8	0.12
11	9 30.5	12 51 42.15	−4 48 1.3	0.5	1.9	0.13	25	6 31.2	12 49 21.39	−4 35 3.3	0.5	1.8	0.12
12	9 26 4	12 51 35.36	4 47 20.4	0 5	1.9	0.13	26	6 27.3	12 49 22.53	4 35 13.2	0.5	1.8	0.12
13	9 22.4	12 51 28.70	4 46 40.5	0.5	1.9	0.13	27	6 23.4	12 49 23.86	4 35 24.3	0.5	1.8	0.12
14	9 18.3	12 51 22.19	4 46 1.5	0.5	1.9	0.13	28	6 19.5	12 49 25.38	4 35 36.6	0.5	1.8	0.12
15	9 14.3	12 51 15.82	4 45 23.4	0.5	1.9	0.13	29	6 15.6	12 49 27.10	4 35 50.2	0.5	1.8	0.12
16	9 10.3	12 51 9.59	−4 44 46.3	0.5	1.9	0.13	30	6 11.7	12 49 29.01	−4 36 4.9	0.5	1.8	0.12
17	9 6.3	12 51 3.52	−4 44 10.2	0.5	1.9	0.13	July 1	6 7.8	12 49 31.12	−4 36 20.9	0.5	1.8	0.12

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Jan. 1	8 58.4	3 43 1.45	+17 57 6.1	0.3	1.3	0.09	Feb. 15	6 0.1	3 41 38.64	+17 55 12.8	0.3	1.3	0.09
2	8 54.4	3 42 56.86	17 56 53.9	0.3	1.3	0.09	16	5 56.2	3 41 39.95	17 55 21.0	0.3	1.3	0.09
3	8 50.4	3 42 52.38	17 56 42.0	0.3	1.3	0.09	17	5 52.3	3 41 41.40	17 55 29.7	0.3	1.3	0.09
4	8 46.4	3 42 48.00	17 56 30.6	0.3	1.3	0.09	18	5 48.4	3 41 43.00	17 55 38.8	0.3	1.3	0.09
5	8 42.4	3 42 43.73	17 56 19.6	0.3	1.3	0.09	19	5 44.5	3 41 44.73	17 55 48.4	0.3	1.3	0.09
6	8 38.4	3 42 39.57	+17 56 9.0	0.3	1.3	0.09	20	5 40.6	3 41 46.60	+17 55 58.4	0.3	1.3	0.09
7	8 34.4	3 42 35.52	17 55 58.8	0.3	1.3	0.09	21	5 36.7	3 41 48.61	17 56 8.9	0.3	1.3	0.09
8	8 30.4	3 42 31.59	17 55 49.0	0.3	1.3	0.09	22	5 32.8	3 41 50.76	17 56 19.8	0.3	1.3	0.09
9	8 26.4	3 42 27.77	17 55 39.6	0.3	1.3	0.09	23	5 28.9	3 41 53.05	17 56 31.2	0.3	1.3	0.09
10	8 22.4	3 42 24.07	17 55 30.6	0.3	1.3	0.09	24	5 25.0	3 41 55.47	17 56 43.0	0.3	1.3	0.09
11	8 18.4	3 42 20.49	+17 55 22.1	0.3	1.3	0.09	25	5 21.1	3 41 58.03	+17 56 55.2	0.3	1.3	0.09
12	8 14.4	3 42 17.04	17 55 14.0	0.3	1.3	0.09	26	5 17.2	3 42 0.73	17 57 7.9	0.3	1.3	0.09
13	8 10.4	3 42 13.70	17 55 6.4	0.3	1.3	0.09	27	5 13.3	3 42 3.56	17 57 21.0	0.3	1.3	0.09
14	8 6.4	3 42 10.49	17 54 59.2	0.3	1.3	0.09	28	5 9.4	3 42 6.53	17 57 34.5	0.3	1.3	0.09
15	8 2.4	3 42 7.41	17 54 52.4	0.3	1.3	0.09	29	5 5.6	3 42 9.63	17 57 48.4	0.3	1.3	0.09
16	7 58.5	3 42 4.45	+17 54 46.0	0.3	1.3	0.09	Sept. 1	17 14.3	4 2 23.92	+18 59 17.0	0.3	1.3	0.09
17	7 54.5	3 42 1.62	17 54 40.1	0.3	1.3	0.09	2	17 10.5	4 2 24.18	18 59 14.5	0.3	1.3	0.09
18	7 50.5	3 41 58.92	17 54 34.7	0.3	1.3	0.09	3	17 6.6	4 2 24.31	18 59 11.6	0.3	1.3	0.09
19	7 46.5	3 41 56.35	17 54 29.7	0.3	1.3	0.09	4	17 2.6	4 2 24.30	18 59 8.4	0.3	1.3	0.09
20	7 42.6	3 41 53.92	17 54 25.2	0.3	1.3	0.09	5	16 58.7	4 2 24.14	18 59 4.7	0.3	1.3	0 09
21	7 38.6	3 41 51.61	+17 54 21.2	0.3	1.3	0.09	6	16 54.7	4 2 23.85	+18 59 0.7	0.3	1.3	0.09
22	7 34.6	3 41 49.44	17 54 17.6	0.3	1.3	0.09	7	16 50.8	4 2 23.42	18 58 56.3	0.3	1.3	0.09
23	7 30.7	3 41 47.40	17 54 14.5	0.3	1.3	0.09	8	16 46.9	4 2 22.86	18 58 51.5	0.3	1.3	0.09
24	7 26.7	3 41 45.50	17 54 11.8	0.3	1.3	0.09	9	16 42.9	4 2 22.16	18 58 46.4	0.3	1.3	0.09
25	7 22.7	3 41 43.73	17 54 9.6	0.3	1.3	0.09	10	16 39.0	4 2 21.33	18 58 40.8	0.3	1.3	0.09
26	7 18.8	3 41 42.10	+17 54 7.9	0.3	1.3	0.09	11	16 35.0	4 2 20.36	+18 58 34.9	0.3	1.3	0.09
27	7 14.8	3 41 40.60	17 54 6.7	0.3	1.3	0.09	12	16 31.1	4 2 19.25	18 58 28.6	0.3	1.3	0.09
28	7 10.9	3 41 39.24	17 54 5.9	0.3	1.3	0.09	13	16 27.1	4 2 18.00	18 58 22.0	0.3	1.3	0.09
29	7 6.9	3 41 38.02	17 54 5.6	0.3	1.3	0.09	14	16 23.2	4 2 16.62	18 58 15.0	0.3	1.3	0.09
30	7 3.0	3 41 36.94	17 54 5.8	0.3	1.3	0.09	15	16 19.2	4 2 15.11	18 58 7.6	0.3	1.3	0.09
31	6 59.0	3 41 35.99	+17 54 6.4	0.3	1.3	0.09	16	16 15.2	4 2 13.47	+18 57 59.9	0.3	1.3	0.09
Feb. 1	6 55.1	3 41 35.18	17 54 7.5	0.3	1.3	0.09	17	16 11.3	4 2 11.69	18 57 51.8	0.3	1.3	0.09
2	6 51.1	3 41 34.51	17 54 9.1	0.3	1.3	0.09	18	16 7.3	4 2 9.78	18 57 43.4	0.3	1.3	0.09
3	6 47.2	3 41 33.98	17 54 11.2	0.3	1.3	0.09	19	16 3.4	4 2 7.74	18 57 34.6	0.3	1.3	0.09
4	6 43.2	3 41 33.59	17 54 13.7	0.3	1.3	0.09	20	15 59.4	4 2 5.57	18 57 25.5	0.3	1.3	0.09
5	6 39.3	3 41 33.34	+17 54 16.7	0.3	1.3	0.09	21	15 55.4	4 2 3.27	+18 57 16.0	0.3	1.3	0.09
6	6 35.4	3 41 33.23	17 54 20.2	0.3	1.3	0.09	22	15 51.4	4 2 0 84	18 57 6.2	0.3	1.3	0.09
7	6 31.4	3 41 33.27	17 54 24.2	0.3	1.3	0.09	23	15 47.5	4 1 58.28	18 56 56.1	0.3	1.3	0.09
8	6 27.5	3 41 33.44	17 54 28.6	0.3	1.3	0.09	24	15 43.5	4 1 55.60	18 56 45.6	0.3	1.3	0.09
9	6 23.6	3 41 33.76	17 54 33.5	0.3	1.3	0.09	25	15 39.5	4 1 52.80	18 56 34.8	0.3	1.3	0.09
10	6 19.7	3 41 34.22	+17 54 38.9	0.3	1.3	0.09	26	15 35.5	4 1 49.87	+18 56 23.7	0.3	1.3	0.09
11	6 15.7	3 41 34.82	17 54 44.7	0.3	1.3	0.09	27	15 31.6	4 1 46.81	18 56 12.3	0.3	1.3	0.09
12	6 11.8	3 41 35.56	17 54 51.0	0.3	1.3	0.09	28	15 27.6	4 1 43.63	18 56 0.4	0.3	1.3	0.09
13	6 7.9	3 41 36.45	17 54 57.8	0.3	1.3	0.09	29	15 23.6	4 1 40.32	18 55 48.3	0.3	1.3	0.09
14	6 4.0	3 41 37.47	17 55 5.1	0.3	1.3	0.09	30	15 19.6	4 1 36.90	18 55 35.9	0.3	1.3	0.09
15	6 0.1	3 41 38.64	+17 55 12.8	0.3	1.3	0.09	Oct. 1	15 15.6	4 1 33.36	+18 55 23.1	0.3	1.3	0.09
16	5 56.2	3 41 39.95	+17 55 21.0	0.3	1.3	0.09	2	15 11.6	4 1 29.70	+18 55 10.1	0.3	1.3	0.09

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Oct. 1	15 15.6	4 1 33.36	+18 55 23.1	0.3	1.3	0.09	Nov. 16	12 10.4	3 57 12.34	+18 41 37.9	0.3	1.3	0.09
2	15 11.6	4 1 29.70	18 55 10.1	0.3	1.3	0.09	17	12 6.4	3 57 5.38	18 41 17.3	0.3	1.3	0.09
3	15 7.6	4 1 25.92	18 54 56.8	0.3	1.3	0.09	18	12 2.3	3 56 58.41	18 40 56.7	0.3	1.3	0.09
4	15 3.6	4 1 22.03	18 54 43.1	0.3	1.3	0.09	19	11 58.3	3 56 51.43	18 40 36.2	0.3	1.3	0.09
5	14 59.6	4 1 18.02	18 54 29.2	0.3	1.3	0.09	20	11 54.2	3 56 44.45	18 40 15.7	0.3	1.3	0.09
6	14 55.6	4 1 13.90	+18 54 14.9	0.3	1.3	0.09	21	11 50.2	3 56 37.45	+18 39 55.2	0.3	1.3	0.09
7	14 51.6	4 1 9.65	18 51 0.4	0.3	1.3	0.09	22	11 46.1	3 56 30.45	18 39 34.7	0.3	1.3	0.09
8	14 47.6	4 1 5.31	18 53 45.6	0.3	1.3	0.09	23	11 42.1	3 56 23.44	18 39 14.2	0.3	1.3	0.09
9	14 43.6	4 1 0.86	18 53 30.6	0.3	1.3	0.09	24	11 38.0	3 56 16.43	18 38 53.7	0.3	1.3	0.09
10	14 39.6	4 0 56.31	18 53 15.3	0.3	1.3	0.09	25	11 34.0	3 56 9.43	18 38 33.4	0.3	1.3	0.09
11	14 35.6	4 0 51.66	+18 52 59.7	0.3	1.3	0.09	26	11 29.9	3 56 2.45	+18 38 13.2	0.3	1.3	0.09
12	14 31.6	4 0 46.90	18 52 43.9	0.3	1.3	0.09	27	11 25.9	3 55 55.48	18 37 53.0	0.3	1.3	0.09
13	14 27.6	4 0 42.04	18 52 27.8	0.3	1.3	0.09	28	11 21.8	3 55 48.53	18 37 33.0	0.3	1.3	0.09
14	14 23.6	4 0 37.08	18 52 11.5	0.3	1.3	0.09	29	11 17.8	3 55 41.59	18 37 13.0	0.3	1.3	0.09
15	14 19.5	4 0 32.02	18 51 54.9	0.3	1.3	0.09	30	11 13.7	3 55 34.67	18 36 53.2	0.3	1.3	0.09
16	14 15.5	4 0 26.87	+18 51 38.1	0.3	1.3	0.09	Dec. 1	11 9.7	3 55 27.76	+18 36 33.4	0.3	1.3	0.09
17	14 11.5	4 0 21.63	18 51 21.1	0.3	1.3	0.09	2	11 5.6	3 55 20.88	18 36 13.7	0.3	1.3	0.09
18	14 7.5	4 0 16.30	18 51 3.8	0.3	1.3	0.09	3	11 1.6	3 55 14.04	18 35 54.2	0.3	1.3	0.09
19	14 3.5	4 0 10.88	18 50 46.4	0.3	1.3	0.09	4	10 57.6	3 55 7.23	18 35 34.9	0.3	1.3	0.09
20	13 59.4	4 0 5.38	18 50 28.7	0.3	1.3	0.09	5	10 53.5	3 55 0.46	18 35 15.7	0.3	1.3	0.09
21	13 55.4	3 59 59.79	+18 50 10.8	0.3	1.3	0.09	6	10 49.5	3 54 53.73	+18 34 56.7	0.3	1.3	0.09
22	13 51.4	3 59 54.11	18 49 52.8	0.3	1.3	0.09	7	10 45.4	3 54 47.03	18 34 37.9	0.3	1.3	0.09
23	13 47.4	3 59 48.35	18 49 34.5	0.3	1.3	0.09	8	10 41.4	3 54 40.37	18 34 19.2	0.3	1.3	0.09
24	13 43.3	3 59 42.52	18 49 16.1	0.3	1.3	0.09	9	10 37.3	3 54 33.75	18 34 0.7	0.3	1.3	0.09
25	13 39.3	3 59 36.61	18 48 57.5	0.3	1.3	0.09	10	10 33.3	3 54 27.18	18 33 42.4	0.3	1.3	0.09
26	13 35.3	3 59 30.63	+18 48 38.7	0.3	1.3	0.09	11	10 29.3	3 54 20.67	+18 33 24.3	0.3	1.3	0.09
27	13 31.2	3 59 24.58	18 48 19.8	0.3	1.3	0.09	12	10 25.2	3 54 14.22	18 33 6.4	0.3	1.3	0.09
28	13 27.2	3 59 18.47	18 48 0.7	0.3	1.3	0.09	13	10 21.2	3 54 7.83	18 32 48.8	0.3	1.3	0.09
29	13 23.2	3 59 12.28	18 47 41.4	0.3	1.3	0.09	14	10 17.1	3 54 1.50	18 32 31.4	0.3	1.3	0.09
30	13 19.1	3 59 6.02	18 47 22.0	0.3	1.3	0.09	15	10 13.1	3 53 55.23	18 32 14.2	0.3	1.3	0.09
31	13 15.1	3 58 59.69	+18 47 2.4	0.3	1.3	0.09	16	10 9.1	3 53 49.01	+18 31 57.2	0.3	1.3	0.09
Nov. 1	13 11.1	3 58 53.31	18 46 42.7	0.3	1.3	0.09	17	10 5.0	3 53 42.85	18 31 40.5	0.3	1.3	0.09
2	13 7.0	3 58 46.88	18 46 23.0	0.3	1.3	0.09	18	10 1.0	3 53 36.76	18 31 24.0	0.3	1.3	0.09
3	13 3.0	3 58 40.39	18 46 3.1	0.3	1.3	0.09	19	9 57.0	3 53 30.75	18 31 7.8	0.3	1.3	0.09
4	12 58.9	3 58 33.86	18 45 43.1	0.3	1.3	0.09	20	9 52.9	3 53 24.82	18 30 51.9	0.3	1.3	0.09
5	12 54.9	3 58 27.27	+18 45 23.0	0.3	1.3	0.09	21	9 48.9	3 53 18.97	+18 30 36.3	0.3	1.3	0.09
6	12 50.9	3 58 20.64	18 45 2.9	0.3	1.3	0.09	22	9 44.9	3 53 13.19	18 30 20.9	0.3	1.3	0.09
7	12 46.8	3 58 13.95	18 44 42.6	0.3	1.3	0.09	23	9 40.8	3 53 7.49	18 30 5.8	0.3	1.3	0.09
8	12 42.8	3 58 7.22	18 44 22.2	0.3	1.3	0.09	24	9 36.8	3 53 1.87	18 29 51.0	0.3	1.3	0.09
9	12 38.7	3 58 0.46	18 44 1.8	0.3	1.3	0.09	25	9 32.8	3 52 56.33	18 29 36.5	0.3	1.3	0.09
10	12 34.7	3 57 53.68	+18 43 41.3	0.3	1.3	0.09	26	9 28.8	3 52 50.87	+18 29 22.3	0.3	1.3	0.09
11	12 30.7	3 57 46.86	18 43 20.8	0.3	1.3	0.09	27	9 24.8	3 52 45.51	18 29 8.4	0.3	1.3	0.09
12	12 26.6	3 57 40.01	18 43 0.3	0.3	1.3	0.09	28	9 20.7	3 52 40.25	18 28 54.9	0.3	1.3	0.09
13	12 22.6	3 57 33.14	18 42 39.7	0.3	1.3	0.09	29	9 16.7	3 52 35.09	18 28 41.7	0.3	1.3	0.09
14	12 18.5	3 57 26.23	18 42 19.1	0.3	1.3	0.09	30	9 12.7	3 52 30.02	18 28 28.8	0.3	1.3	0.09
15	12 14.5	3 57 19.29	+18 41 58.5	0.3	1.3	0.09	31	9 8.7	3 52 25.04	+18 28 16.3	0.3	1.3	0.09
16	12 10.4	3 57 12.34	+18 41 37.9	0.3	1.3	0.09	32	9 4.7	3 52 20.16	+18 28 4.1	0.3	1.3	0.09

PART III

PHENOMENA

ECLIPSES IN 1888.

In the year 1888 there will be five eclipses, three of the sun and two of the moon.

I.—*A Total Eclipse of the Moon*, 1888, January 28, visible at Washington, and generally throughout North and South America, Europe, Asia and Africa.

ELEMENTS OF THE ECLIPSE.

Greenwich mean time of ☽ in right ascension, January 28 d 11 h 22 m 3.6 s

Sun's right ascension	20 h 43 m 52.65 s	Hourly motion	10.31 s
Moon's right ascension	8 43 52.65	Hourly motion	142.56
Sun's declination	18° 8′ 11.″9 S.	Hourly motion	39.″7 N.
Moon's declination	18 1 43.2 N.	Hourly motion	5 52.5 S.
Sun's equa. hor. parallax	9.0	Sun's true semidiameter	16 14.4
Moon's equa. hor. parallax	58 11.1	Moon's true semidiameter	15 50.6

TIMES OF THE PHASES.

	Greenwich Mean Time.		Washington Mean Time.	
		d h m		d h m
Moon enters penumbra	January	28 8 27.7	January	28 3 19.5
Moon enters shadow		28 9 30.4		28 4 22.2
Total eclipse begins		28 10 30.9		28 5 22.7
Middle of the eclipse		28 11 20.1		28 6 11.9
Total eclipse ends		28 12 9.2		28 7 1.0
Moon leaves shadow		28 13 9.5		28 8 1.3
Moon leaves penumbra		28 14 11.9		28 9 3.7

CIRCUMSTANCES OF THE ECLIPSE.

Contacts of Shadow with moon's limb.	Angles of position from north point.	The moon being in the zenith in longitude from Greenwich and latitude.	
First	93° to E.	39° 40′.2 E.	18° 12′.5 N.
Last	74 to W.	13 4.8 W.	17 50.5 N.

Magnitude of the eclipse = 1.647, (moon's diameter = 1).

II.—*A Partial Eclipse of the Sun*, 1888, February 11, invisible at Washington.

ELEMENTS OF THE ECLIPSE.

Greenwich mean time of ☌ in right ascension, February 11 d 11 h 3 m 51.0 s

Sun and moon's R. A.	21 h 40 m 16.10 s	Hourly motions	9.85 and 129.24 s
Sun's declination	13° 57′ 2.″2 S.	Hourly motion	49.″5 N.
Moon's declination	15 10 10.3 S.	Hourly motion	7 43.2 N.
Sun's equa. hor. parallax	9.0	Sun's true semidiameter	16 12.1
Moon's equa. hor. parallax	56 12.3	Moon's true semidiameter	15 18.2

CIRCUMSTANCES OF THE ECLIPSE.

		d h m		
Eclipse begins	February	11 9 55.3	in long. 93° 57′.2 E.	and in lat. 64° 7′.8 S.
Greatest eclipse		11 11 38.2	35 27.0 W.	70 48.4 S.
Eclipse ends		11 13 21.5	94 54.6 W.	39 40.2 S.

Magnitude of greatest eclipse = 0.502, (sun's diameter = 1).

III.—*A Partial Eclipse of the Sun*, 1888, July 8, invisible at Washington.

ELEMENTS OF THE ECLIPSE.

Greenwich mean time of ☌ in right ascension, July 8 d 18 h 35 m 30.6 s

Sun and moon's R. A.	7 h 15 m 29.63 s	Hourly motions	10.22 s and 135.20 s
Sun's declination	22° 19′ 4.7″ N.	Hourly motion	18.4″ S.
Moon's declination	21 7 54.4 N.	Hourly motion	1 14.8 S.
Sun's equa. hor. parallax	8.7	Sun's true semidiameter	15 44.0
Moon's equa. hor. parallax	55 42.9	Moon's true semidiameter	15 10.2

CIRCUMSTANCES OF THE ECLIPSE.

Eclipse begins	July 8 d 16 h 50.1 m	in long. 46° 9.6′ E.	and in lat. 48° 17.8′ S.
Greatest eclipse	8 18 30.9	78 49.1 E.	67 36.6 S.
Eclipse ends	8 20 11.6	117 37.1 E.	51 13.4 S.

Magnitude of the eclipse = 0.500, (sun's diameter = 1).

IV.—*A Total Eclipse of the Moon*, 1888, July 22, visible at Washington, and generally throughout North and South America, and portions of Europe, Africa and the Pacific Ocean.

ELEMENTS OF THE ECLIPSE.

Greenwich mean time of ☍ in right ascension, July 22 d 17 h 44 m 29.5 s

Sun's right ascension	8 h 11 m 48.02 s	Hourly motion	9.92 s
Moon's right ascension	20 11 48.02	Hourly motion	147.84
Sun's declination	20° 0′ 12.7″ N.	Hourly motion	31.0″ S.
Moon's declination	20 1 44.7 S.	Hourly motion	4 24.0 N.
Sun's equa. hor. parallax	8.7	Sun's true semidiameter	15 44.9
Moon's equa. hor. parallax	58 43.0	Moon's true semidiameter	15 59.2

TIMES OF THE PHASES.

	Greenwich Mean Time.		Washington Mean Time.	
		d h m		d h m
Moon enters penumbra	July	22 14 55.5	July	22 9 47.3
Moon enters shadow		22 15 54.7		22 10 46.5
Total eclipse begins		22 16 53.6		22 11 45.4
Middle of the eclipse		22 17 44.8		22 12 36.6
Total eclipse ends		22 18 36.0		22 13 27.8
Moon leaves shadow		22 19 34.8		22 14 26.6
Moon leaves penumbra		22 20 33.9		22 15 25.7

CIRCUMSTANCES OF THE ECLIPSE.

Contacts of Shadow with moon's limb.	Angles of position from north point.	The moon being in the zenith in longitude from Greenwich	and latitude.
First	82° to E.	61° 16.2′ W.	20° 9.6′ S.
Last	96 to W.	114 12.3 W.	19 53.4 S.

Magnitude of the eclipse = 1.025, (moon's diameter = 1)

V.—*A Partial Eclipse of the Sun*, 1888, August 7, invisible at Washington.

ELEMENTS OF THE ECLIPSE.

Greenwich mean time of δ in right ascension, August $7^{d}\ 5^{h}\ 32^{m}\ 35.0^{s}$

Sun and moon's R. A.	$9^{h}\ 12^{m}\ 7.04^{s}$		Hourly motion	9.54^{s} and	143.13^{s}
Sun's declination	$16^{\circ}\ 10'\ 47.''4$	N.	Hourly motion	$42.''6$	S.
Moon's declination	$17^{\circ}\ 34'\ 34.''7$	N.	Hourly motion	$6'\ 59.''3$	S.
Sun's equa. hor. parallax	$8.''7$		Sun's true semidiameter	$15'\ 46.''7$	
Moon's equa. hor. parallax	$57'\ 13.''1$		Moon's true semidiameter	$15'\ 34.''7$	

CIRCUMSTANCES OF THE ECLIPSE.

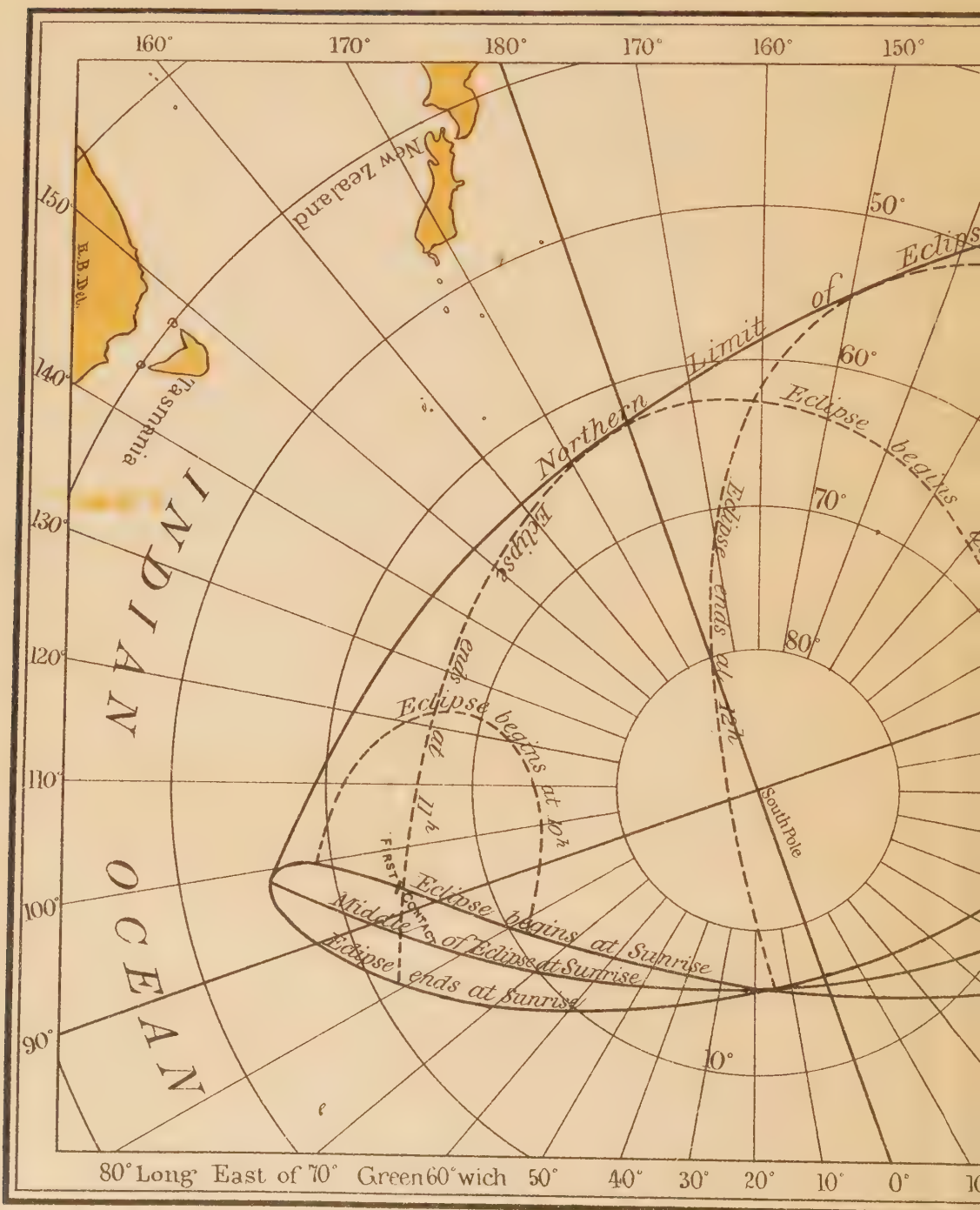
Eclipse begins	August	$7^{d}\ 5^{h}\ 2.4^{m}$	in long.	$157^{\circ}\ 39'.6$	E. and in lat.	$71^{\circ}\ 7'.6$	N.
Greatest eclipse		$7\ 6\ 5.8$		$53\ 11.2$	E.	$70\ 6.8$	N.
Eclipse ends		$7\ 7\ 9.4$		$6\ 52.3$	E.	$53\ 17.8$	N.

Magnitude of greatest eclipse = 0.198, (sun's diameter = 1).

No chart of this eclipse is given, but the regions within which it is visible are chiefly the Arctic Ocean, Norway and Sweden, portions of Denmark and Greenland, and the extreme northerly parts of North America and Asia.

The regions within which the first two eclipses of the sun are visible, are laid down on the accompanying charts, from which, by means of the dotted lines, the Greenwich time of beginning or ending within fifteen or twenty minutes, may also be found

PARTIAL ECLIPSE OF



Note.—*The hours of beginning and ending*

EBRUARY 11TH 1888.

pressed in Greenwich Mean Time.

BESSELIAN ELEMENTS OF THE PARTIAL ECLIPSE OF THE SUN, 1888, FEBRUARY 11.

Greenwich Mean Time.	Co-ordinates of Centre of Shadow on Fundamental Plane.		Direction of Axis of Shadow.			Radius of Penumbra on Fundamental Plane.
	x	y	Log sin d	Log cos d	μ	l
h m						
9 50	−0.63246	−1.45504	−9.38257	+9.98697	143° 52.7′	+0.56175
10 0	−0.54682	−1.43468	−9.38251	+9.98698	146 22.7	+0.56177
10	0.46117	1.41431	9.38244	9.98698	148 52.7	0.56180
20	0.37553	1.39393	9.38237	9.98698	151 22.7	0.56182
30	0.28989	1.37355	9.38230	9.98699	153 52.8	0.56184
40	0.20425	1.35316	9.38223	9.98699	156 22.8	0.56186
50	0.11861	1.33277	9.38216	9.98700	158 52.8	0.56188
11 0	−0.03297	−1.31237	−9.38210	+9.98700	161 22.8	+0.56190
10	+0.05267	1.29196	9.38203	9.98701	163 52.8	0.56192
20	0.13831	1.27154	9.38196	9.98701	166 22.8	0.56194
30	0.22395	1.25112	9.38189	9.98701	168 52.8	0.56196
40	0.30958	1.23069	9.38182	9.98702	171 22.8	0.56198
50	0.39521	1.21025	9.38175	9.98702	173 52.9	0.56200
12 0	+0.48084	−1.18980	−9.38169	+9.98703	176 22.9	+0.56201
10	0.56646	1.16934	9.38162	9.98703	178 52.9	0.56203
20	0.65208	1.14887	9.38155	9.98704	181 22.9	0.56205
30	0.73769	1.12840	9.38148	9.98704	183 52.9	0.56207
40	0.82330	1.10792	9.38141	9.98704	186 22.9	0.56209
50	0.90891	1.08744	9.38134	9.98705	188 52.9	0.56210
13 0	+0.99452	−1.06695	−9.38128	+9.98705	191 22.9	+0.56211
10	1.08012	1.04645	9.38121	9.98706	193 53.0	0.56213
20	1.16571	1.02594	9.38114	9.98706	196 23.0	0.56214
30	+1.25130	−1.00543	−9.38107	+9.98706	198 53.0	+0.56215

Greenwich Mean Time.	Log Δx for 1 Minute.	Log Δy for 1 Minute.	Log $\Delta \mu$ for 1 Minute.	Log Tangent of Angle of Cone— Penumbra.
h				
9	+7.9327	+7.3076	+1.1761	+7.67544
10	7.9327	7.3088	1.1761	7.67544
11	7.9327	7.3098	1.1761	7.67544
12	7.9326	7.3107	1.1761	7.67543
13	7.9325	7.3117	1.1761	7.67543
14	+7.9323	+7.3126	+1.1761	+7.67543

BESSELIAN ELEMENTS OF THE PARTIAL ECLIPSE OF THE SUN, 1888, JULY 8.

Greenwich Mean Time.	Co-ordinates of Centre of Shadow on Fundamental Plane.		Direction of Axis of Shadow.			Radius of Penumbra on Fundamental Plane.
	x	y	Log sin d	Log cos d	μ	l
h m					° ′	
16 50	−0.92207	−1.25198	+9.57971	+9.96615	251 15.5	+0.55618
17 0	−0.83469	−1.25467	+9.57970	+9.96615	253 45.5	+0.55617
10	0.74731	1.25736	9.57969	9.96615	256 15.5	0.55616
20	0.65992	1.26006	9.57967	9.96615	258 45.5	0.55615
30	0.57253	1.26277	9.57965	9.96616	261 15.5	0.55614
40	0.48514	1.26548	9.57964	9.96616	263 45.5	0.55612
50	0.39775	1.26820	9.57962	9.96616	266 15.5	0.55610
18 0	−0.31036	−1.27092	+9.57960	+9.96617	268 45.5	+0.55608
10	0.22296	1.27365	9.57959	9.96617	271 15.5	0.55607
20	0.13556	1.27638	9.57957	9.96617	273 45.5	0.55606
30	−0.04816	1.27911	9.57956	9.96617	276 15.5	0.55604
40	+0 03924	1.28185	9.57954	9.96618	278 45 5	0.55602
50	0.12664	1.28460	9.57953	9.96618	281 15.5	0.55600
19 0	+0.21405	−1.28735	+9.57951	+9.96618	283 45.5	+0.55598
10	0.30146	1.29011	9.57950	9.96618	286 15.5	0.55596
20	0 38887	1.29288	9.57948	9.96619	288 45.5	0.55594
30	0.47627	1.29565	9.57947	9.96619	291 15.5	0.55592
40	0.56367	1.29842	9.57945	9.96619	293 45.5	0.55590
50	0.65107	1.30120	9.57944	9.96620	296 15.5	0.55588
20 0	+0.73847	−1.30398	+9.57942	+9.96620	298 45.5	+0.55586
10	0.82587	1.30677	9.57941	9.96620	301 15.5	0.55584
20	+0.91327	−1.30956	+9.57939	+9.96620	303 45.5	+0.55582

Greenwich Mean Time.	Log Δx for 1 Minute.	Log Δy for 1 Minute.	Log $\Delta \mu$ for 1 Minute.	Log Tangent of Angle of Cone—
				Penumbra.
h				
15	+7.9414	−6.4246	+1.1761	+7.66271
16	7.9414	6.4302	1.1761	7.66271
17	7.9415	6.4352	1.1761	7.66271
18	7.9415	6.4401	1.1761	7.66271
19	7.9415	6.4449	1.1761	7.66271
20	+7.9415	−6.4490	+1.1761	+7.66271

PARTIAL ECLIPSE

Note-*The hours of beginning and ending a*

JULY 8TH 1888.

pressed in Greenwich Mean Time.

BESSELIAN ELEMENTS OF THE PARTIAL ECLIPSE OF THE SUN, 1888, AUGUST 7.

Greenwich Mean Time.	Co-ordinates of Centre of Shadow on Fundamental Plane.		Direction of Axis of Shadow.			Radius of Penumbra on Fundamental Plane.
	x	y	Log sin d	Log cos d	μ	l
h m					° ′	
5 0	−0.28748	+1.52785	+9.44514	+9.98244	73 38.3	+0.54938
10	0.19915	1.50944	9.44508	9.98245	76 8.3	0.54937
20	0.11082	1.49102	9.44503	9.98245	78 38.4	0.54936
30	−0.02249	1.47259	9.44498	9.98245	81 8.4	0.54934
40	+0.06583	1.45415	9.44493	9.98246	83 38.4	0.54932
50	0.15416	1.43571	9.44488	9.98246	86 8.4	0.54930
6 0	+0.24248	+1.41726	+9.44483	+9.98247	88 38.5	+0.54928
10	0.33080	1.39880	9.44478	9.98247	91 8.5	0.54926
20	0.41912	1.38033	9.44473	9.98248	93 38.5	0.54924
30	0.50744	1.36185	9.44468	9.98248	96 8.5	0.54922
40	0.59576	1.34336	9.44463	9.98248	98 38.6	0.54920
50	0.68408	1.32486	9.44458	9.98249	101 8.6	0.54918
7 0	+0.77240	+1.30634	+9.44453	+9.98249	103 38.6	+0.54916
10	+0.86071	+1.28781	+9.44448	+9.98250	106 8.6	+0.54914

Greenwich Mean Time.	Log Δ x for 1 Minute.	Log Δ y for 1 Minute.	Log Δ μ for 1 Minute.	Log Tangent of Angle of Cone
				Penumbra.
h				
5	+7.9461	−7.2649	+1.1762	+7.66394
6	7.9461	7.2662	1.1762	7.66394
7	+7.9460	−7.2676	+1.1762	+7.66395

WASHINGTON MEAN TIME.

PHASES OF THE MOON.

New Moon.	d	h	m	First Quarter.	d	h	m	Full Moon.	d	h	m	Last Quarter.	d	h	m
January	12	15	30.4	January	20	11	40.9	January	28	6	10.7	January	5	18	34.2
February	11	6	44.2	February	19	8	51.0	February	26	18	49.4	February	4	2	17.5
March	11	23	12.8	March	20	3	35.2	March	27	4	59.3	March	4	10	17.7
April	10	15	59.5	April	18	18	44.2	April	25	13	14.0	April	2	19	33.0
May	10	8	15.3	May	18	5	57.0	May	24	20	31.9	May	2	6	38.9
June	8	23	25.8	June	16	13	41.5	June	23	3	59.3	May	31	19	45.1
July	8	13	8.4	July	15	19	4.6	July	22	12	36.9	June	30	10	44.4
August	7	1	12.7	August	13	23	35.8	August	20	23	12.1	July	30	3	21.4
September	5	11	47.9	September	12	4	51.7	September	19	12	16.1	August	28	21	9.7
October	4	21	26.0	October	11	12	20.8	October	19	4	0.8	September	27	15	22.0
November	3	6	54.2	November	9	23	7.5	November	17	22	7.7	October	27	8	47.5
December	2	16	57.4	December	9	13	37.6	December	17	17	32.6	November	26	0	12.2
												December	25	12	51.7

PERIGEE, APOGEE, AND GREATEST LIBRATION.

Perigee.	d	h	Apogee.	d	h	Greatest Libration.	d	h	m		Greatest Libration.	d	h	m	
January	7	19.6	January	20	7.8	January	14	5	29	W.	January	26	2	58	E.
February	1	12.3	February	17	4.2	February	9	19	44	W.	February	23	5	23	E.
February	28	23.3	March	15	21.1	March	7	1	58	W.	March	22	8	47	E.
March	28	5.4	April	12	5.7	April	3	14	47	W.	April	19	14	35	E.
April	25	15.7	May	9	8.1	May	1	17	44	W.	May	17	17	38	E.
May	24	1.6	June	5	16.2	May	29	23	24	W.	June	14	10	32	E.
June	21	7.1	July	3	5.3	June	27	2	27	W.	July	11	2	24	E.
July	18	24.0	July	31	0.9	July	24	22	46	W.	August	6	13	10	E.
August	13	18.9	August	27	19.6	August	21	5	22	W.	September	2	21	9	E.
September	8	18.0	September	24	14.0	September	16	14	3	W.	October	0	18	48	E.
October	6	13.8	October	22	5.1	October	13	7	45	W.	October	29	0	6	E.
November	3	21.8	November	18	10.9	November	10	3	2	W.	November	26	7	34	E.
December	2	10.4	December	15	12.1	December	8	9	19	W.	December	24	3	48	E.
December	30	22.2													

FORMULÆ FOR THE LIBRATION OF THE MOON.

Put I, the inclination of the moon's equator to the ecliptic ($= 1° 28'.8$),

Ω, the mean longitude of the moon's ascending node, (see page 278), or the mean longitude of the descending node of the moon's equator,

C, the angle at the centre of the moon's disk made by a lunar meridian with the circle of declination, counted from north to east on the apparent disk,

λ, β, a', δ', the apparent longitude, latitude, right ascension, and declination of the moon, corrected for parallax,

λ', the selenocentric longitude of the earth, counted on the moon's equator from its descending node, Ω,

i, Δ, Ω', $\mathbb{C}$, the quantities defined on page 276, where their values for the year are given.

The moon's libration in longitude and latitude may then be found, for any time, by means of the following formulæ, in connection with the tables given on pages 276 and 277 : —

$$\left.\begin{aligned} \Delta\lambda &= -0'.57 \sin 2(\Omega - \lambda) \\ a &= \sin I \cos(\Omega - \lambda) \\ \tan B &= \tan I \sin(\Omega - \lambda) \\ \lambda' &= \lambda + \Delta\lambda + a\,b \end{aligned}\right\} \text{ See table, page 277.}$$

The libration in latitude $= b = B - \beta$

The libration in longitude $= l = \lambda' - \mathbb{C}$

$$\sin C = \sin i \frac{\cos(\lambda' + \Delta - \Omega)}{\cos \delta'} = -\sin i \frac{\cos(a' - \Omega')}{\cos b}$$

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JANUARY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1888.0. $\Delta\alpha$	$\Delta\delta$	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		s	″	° ′	d h m	h m				°	°
7 Leonis	6½	+0.14	−5.3	+14 52.7	1 17 54.6	+ 3 10.9	+0.9137	0.5718	−0.1345	+90	+24
ψ Leonis	6	0.11	5.1	14 31.9	21 20.7	+ 6 29.8	+0.8017	0.5716	0.1399	+90	+16
α Leonis	1½	+0.03	4.1	12 30.8	2 8 12.2	− 7 1.8	+1.2750	0.5685	0.1557	+90	+56
34 Leonis	6½	0.00	4.4	13 54.4	9 37.0	− 5 39.9	−0.3832	0.5682	0.1579	+15	−53
l Leonis	5½	−0.15	3.0	11 8.3	3 2 22.6	+10 30.6	−0.3522	0.5632	0.1778	+17	−54
B. A. C 3837	6½	−0.24	−1.7	+ 8 40.4	13 31.4	− 2 43.5	+0.1314	0.5615	−0.1886	+44	−27
ν Virginis	4	0.39	−0.4	7 9.4	4 3 56.5	+11 12.0	−1.1140	0.5594	0.1991	−30	−83
b Virginis	5½	0.43	+1.0	4 16.7	10 21.1	− 6 36.4	+0.5331	0.5586	0.2022	+71	− 7
c Virginis	5½	0.53	1.6	3 56.2	19 39.4	+ 2 22.9	−1.0170	0.5576	0.2058	−22	−86
B. A. C. 4254	6	0.62	2.6	+ 2 28.4	5 3 51.2	+10 18.1	−1.2240	0.5576	0.2077	−41	−88
80 Virginis	6	−0.89	+6.3	− 4 49.4	6 5 42.7	+11 16.8	+0.8124	0.5616	−0.2052	+85	+ 9
88 Virginis	6½	0.94	6.9	6 16.6	11 26.3	− 7 11.3	+1.1150	0.5622	0.2026	+84	+30
ξ^1 Libræ	6	1.28	9.0	11 26.4	7 16 32.4	− 3 6.4	+0.7204	0.5707	0.1803	+79	+ 4
ξ^2 Libræ	5½	1.30	8.9	10 57.4	17 34.7	− 2 6.3	+0.0438	0.5711	0.1793	+35	−34
17 Libræ	7	1.31	8.8	10 42.1	18 13.8	− 1 28.6	−0.3299	0.5711	0.1786	+15	−56
18 Libræ	6½	−1.31	+8.8	−10 41.6	18 30.4	− 1 12.5	−0.3872	0.5715	−0.1782	+12	−60
B. A. C. 5070	6	1.43	9.1	11 57.9	8 5 13.3	+ 9 7.2	−0.9495	0.5767	0.1658	−23	−90
γ Libræ	4½	1.50	9.7	14 24.7	10 8.3	−10 8.6	+0.7285	0.5786	0.1591	+76	+ 5
η Libræ	6	1.56	9.8	15 18.7	13 44.7	− 6 40.1	+1.0760	0.5798	0.1538	+75	+29
48 Libræ	5½	1.61	9.3	13 57.1	19 42.1	− 0 55.8	−1.1890	0.5821	0.1447	−46	−90
49 Libræ	6	−1.64	+9.8	−16 12.0	20 35.6	− 0 4.3	+0.9561	0.5825	−0.1433	+74	+20
φ Ophiuchi	4½	1.78	9.1	16 21.9	9 9 21.2	−11 47.3	−0.5603	0.5870	0.1212	− 5	−76
24 Scorpii	5½	1.83	9.0	17 31.4	13 37.4	− 7 40.7	+0.1047	0.5879	0.1137	+31	−30
29 Ophiuchi	6½	1.92	8.6	18 43.1	21 53.7	+ 0 16.7	+0.4417	0.5909	0.0976	+50	−11
B. A. C. 6060	6	2.11	6.6	18 46.7	10 19 46.8	− 2 40.6	−1.1380	0.5946	0.0513	−50	−90
μ Sagittarii	4	−2.17	+6.0	−21 5.2	11 2 56.1	+ 4 12.1	+0.9080	0.5946	−0.0358	+69	+18
				NEW	*MOON.*						
θ Capricorni	4	2.09	−3.8	17 40.7	14 2 56.2	+ 1 31.4	+0.3568	0.5678	+0.1112	+46	−16
31 Capricorni	6½	2.06	4.5	17 56.0	8 26.3	+ 6 50.1	+1.2610	0.5635	0.1198	+72	+53
ι Capricorni	4½	−2.04	−4.7	−17 18.8	10 14.6	+ 8 34.7	+0.8256	0.5623	+0.1220	+73	+11
42 Capricorni	5½	1.95	5.4	14 32.9	19 5.4	− 6 52 5	−0.9698	0.5569	0.1345	−28	−90
44 Capricorni	6	1.95	5.6	14 54.8	19 46.9	− 6 12.4	−0.4886	0.5564	0.1354	+ 2	−69
45 Capricorni	6½	1.95	5.7	15 15.8	20 12.8	− 5 47.4	−0.0566	0.5564	0.1359	+25	−40
μ Capricorni	5	1.90	6.0	14 4.8	15 0 30.7	− 1 38.0	−0.7199	0.5527	0.1415	−10	−90
ι Aquarii	4½	−1.85	−6.8	−14 24.9	6 41.8	+ 4 20.9	+0.5338	0.5488	+0.1488	+63	− 7
42 Aquarii	5½	1.82	7.1	13 23.4	11 38.3	+ 9 7.8	+0.1875	0.5465	0.1545	+42	−26
45 Aquarii	6½	1.82	7.3	13 52.0	12 41.3	+10 8.8	+0.8626	0.5455	0.1553	+76	+13
B. A. C. 7835	6½	1.76	7.7	13 29.5	17 59.8	− 8 42.9	+1.3010	0.5429	0.1607	+77	+56
σ Aquarii	5	1.73	7.3	11 15.2	18 19.6	− 8 23.7	−1.0510	0.5429	0.1611	−30	−90
58 Aquarii	6½	−1.73	−7.5	−11 28.8	18 49.6	− 7 54.7	−0.7259	0.5421	+0.1617	− 8	−90
70 Aquarii	6	1.66	8.1	11 8.9	16 3 4.2	+ 0 4.4	+0.2788	0.5373	0.1688	+49	−21
Lalande 44734	6½	1.64	8.2	10 39.4	5 9.5	+ 2 5.9	+0.1026	0.5356	0.1705	+39	−31
ψ^1 Aquarii	4	1.52	8.9	9 41.9	16 46.4	−10 38.5	+1.0920	0.5296	0.1781	+81	+29
χ Aquarii	5½	1.50	8.8	8 20.3	17 16.9	−10 9.0	−0.2930	0.5295	0.1782	+18	−54
B. A. C. 8274	7	−1.33	−9.4	− 7 0.3	17 9 36.0	+ 5 41.0	+1.2430	0.5226	+0.1864	+83	+43
27 Piscium	5	1.26	8.9	4 10.8	14 54.2	+10 50.0	−0.8559	0.5207	0.1881	−12	−90
29 Piscium	5	1.24	8.8	3 39.2	16 33.4	−11 33 7	−1.1180	0.5199	0.1886	−31	−90
4 Ceti	6	1.20	8.8	3 10.5	19 39.8	− 8 32.7	−1.0580	0.5183	0.1890	−26	−90
5 Ceti	6	1.20	8.8	3 4.5	19 54.7	− 8 18.3	−1.1410	0.5183	0.1896	−33	−90
14 Ceti	6	−1.04	−9.1	− 1 7.5	18 10 25.6	+ 5 48.7	−0.5248	0.5151	+0.1916	+ 8	−70
15 Ceti	6½	1.04	9.1	− 1 7.5	11 47.4	+ 7 7.1	−0.2386	0.5146	0.1916	+23	−50
26 Ceti	6	0.88	9.0	+ 0 45.9	19 1 35.5	− 3 28.2	+0.3205	0.5131	0.1912	+55	−19
29 Ceti	6½	0.86	8.9	1 24.4	3 49.2	− 1 18.2	+0.0350	0.5128	0.1908	+38	−34
33 Ceti	6	0.84	8.8	1 50.9	5 13.4	+ 0 3.6	−0.1860	0.5127	0.1904	+26	−47
35 Ceti	6½	−0.83	−8.8	+ 1 52.7	6 17.1	+ 1 5.5	−0.0147	0.5122	+0.1904	+35	−37
f Piscium	5	−0.80	−8.5	+ 3 1.4	9 7.2	+ 3 50.8	−0.7404	0.5121	+0.1897	− 5	−87

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JANUARY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1888.0.		Apparent Declination	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	$''$	° ′	d h m	h m				°	°
ν Piscium	4½	−0.66	−8.4	+ 4 55.1	19 21 49.6	− 7 48.3	−0.4466	0.5130	+0.1864	+12	−64
64 Ceti	5½	0.49	7.8	8 2.6	20 13 49.2	+ 7 44.1	−0.9779	0.5150	0.1796	−20	−82
ξ^1 Ceti	4½	0.48	7.8	8 19.2	14 41.2	+ 8 34.6	−1.1290	0.5154	0.1791	−32	−82
ξ^2 Ceti	4½	0.41	8.1	7 57.4	22 43.6	− 7 36.8	+0.6937	0.5172	0.1746	+89	+ 4
B. A. C. 830	6	0.32	7.5	10 15.7	21 6 14.2	− 0 19.3	−0.5618	0.5189	0.1694	+ 6	−69
μ Ceti	4½	−0.32	−7.7	+ 9 38.3	7 30.6	+ 0 55.0	+0.3389	0.5196	+0.1684	+57	−15
Lalande 5725	6	0.19	6.9	12 45.4	18 36.6	+11 41.5	−1.2770	0.5235	0.1598	−51	−77
f Tauri	4	−0.07	7.2	12 33.0	22 7 6.5	− 0 11.1	+0.8756	0.5284	0.1483	+90	+18
48 Tauri	6	+0.14	6.9	15 7.1	23 5 17.1	− 2 41.5	+1.0690	0.5405	0.1231	+90	+36
γ Tauri	4	0.16	6.9	15 21.3	7 13.6	− 0 48.7	+1.0460	0.5409	0.1202	+90	+34
δ^1 Tauri	4	+0.18	−6.4	+17 16.7	8 42.2	+ 0 37.0	−0.8782	0.5421	+0.1182	−15	−73
63 Tauri	6	0.18	6.6	16 30.7	8 57.1	+ 0 51.5	−0.0109	0.5424	0.1180	+35	−28
δ^2 Tauri	5½	0.18	6.4	17 10.9	9 15.8	+ 1 9.6	−0.7055	0.5425	0.1179	− 4	−72
δ^3 Tauri	5	0.19	6.3	17 40.1	9 55.4	+ 1 47.9	−1.1580	0.5433	0.1168	−38	−72
70 Tauri	6½	0.18	6.8	15 40.9	10 1.6	+ 1 53.9	+1.0220	0.5433	0.1166	+90	+33
75 Tauri	6½	+0.20	−6.8	+16 6.4	11 22.7	+ 3 12.5	+0.7127	0.5441	+0.1146	+90	+13
θ^1 Tauri	4	0.19	6.8	15 42.7	11 26.7	+ 3 16.3	+1.1520	0.5444	0.1146	+90	+45
θ^2 Tauri	4	0.19	6.9	15 37.2	11 29.3	+ 3 18.8	+1.2560	0.5444	0.1146	+90	+58
B. A. C. 1391	5	0.20	6.8	15 56.9	12 23.4	+ 4 11.2	+0.9982	0.5444	0.1129	+90	+32
α Tauri	1	0.22	6.8	16 16.9	14 56 6	+ 6 39.5	+0.9220	0.5458	0.1098	+90	+27
B. A. C. 1468	6½	+0.28	−6.4	+18 31.7	19 48 2	+11 21.7	−1.0060	0.5486	+0.1027	−25	−71
i Tauri	5½	0.30	6.4	18 38.8	22 11.9	−10 19.4	−0.8896	0.5492	0.0993	−16	−71
B. A. C. 1526	5½	0.32	6.9	16 58.5	24 1 2.8	− 7 34.1	+1.1950	0.5505	0.0948	+90	+52
m Tauri	5½	0.36	6.6	18 29.5	5 39.8	− 3 6.2	−0.0270	0.5537	0.0873	+35	−25
119 Tauri	5	0.46	6.8	18 30.4	17 1.8	+ 7 52.9	+0.8424	0.5601	0.0684	+90	+26
120 Tauri	6	+0.47	−6.8	+18 27.5	17 37.6	+ 8 27.4	+0.9340	0.5607	+0.0672	+90	+32
127 Tauri	6½	0.50	6.9	18 55.4	21 50.2	−11 28.7	+0.7013	0.5627	0.0599	+90	+18
χ^1 Orionis	4½	0.53	6.6	20 15.1	25 2 57.4	− 6 32.0	−0.4385	0.5645	0.0506	+12	−46
χ^2 Orionis	6	0.53	6.7	19 43.4	3 12.5	− 6 17.5	+0.1390	0.5646	0.0505	+45	−12
χ^3 Orionis	6	0.56	6.9	19 41.4	6 59.1	− 2 38.8	+0.3487	0.5666	0.0431	+58	0
χ^4 Orionis	5	+0.56	−6.8	+20 8.3	7 10.8	− 2 27.5	−0.1210	0.5669	+0.0429	+29	−26
68 Orionis	6	0.58	6.9	19 48.8	10 45.7	+ 0 59.9	+0.3659	0.5686	0.0358	+60	+ 2
71 Orionis	6	0.59	7.1	19 11.5	12 1.5	+ 2 13.0	+1.0720	0.5694	0.0336	+90	+46
15 Geminorum	6½	0.62	6.8	20 51.4	17 38.2	+ 7 37.8	−0.5451	0.5716	0.0221	+ 5	−52
16 Geminorum	6½	0.62	7.0	20 33.7	17 43.1	+ 7 42.5	−0.2300	0.5716	0.0221	+23	−30
ν Geminorum	4½	+0.63	−6.9	+20 16.8	18 9.9	+ 8 8.4	+0.0797	0.5719	+0.0214	+41	−12
ζ Geminor. *mult.*	4	0.69	7.1	20 43.9	26 9 19.1	− 1 15.1	−0.3147	0.5781	−0.0093	+18	−34
56 Geminorum	5½	0.72	7.3	20 39.2	16 55 7	+ 6 4.9	−0.3548	0.5789	0.0251	+16	−38
61 Geminorum	6	0.72	7.4	20 28.7	19 2.9	+ 8 7.5	−0.2290	0.5801	0.0295	+23	−31
79 Geminorum	6½	0.74	7.4	20 35.0	27 2 45.8	− 8 26.7	−0.6262	0.5808	0.0457	+ 1	−60
g Geminorum	5½	+0.74	−7.6	+18 46.9	3 12.8	− 8 0.6	+1.2310	0.5809	−0.0464	+90	+62
85 Geminorum	6	0.74	7.5	20 10.6	7 12.7	− 4 9.6	−0.4253	0.5817	0.0547	+12	−46
d^1 Cancri	6	0.74	7.7	18 41.4	18 54.8	+ 7 6.6	+0.3352	0.5828	0.0787	+57	− 4
Saturn				20 4.2	20 20.0	+ 8 28.7	−1.2070	0.5916	0.0838	−46	−70
θ Cancri	5½	0.74	7.7	18 28.2	22 23.1	+10 27.2	+0.2776	0.5826	0.0862	+53	− 8
δ Cancri	4	+0.74	−7.7	+18 33.8	28 3 53.9	− 8 14.1	−0.3219	0.5826	−0.0966	+18	−42
7 Leonis	6½	0.71	7.5	14 52.7	29 1 37.2	−11 18.8	+0.9286	0.5804	0.1362	+90	+25
ψ Leonis	6	0.70	7.3	14 31.9	4 57.9	− 8 5.3	+0.8177	0.5793	0.1413	+90	+17
34 Leonis	6½	0.65	7.1	13 54.4	16 55.4	+ 3 26.1	−0.3480	0.5765	0.1596	+17	−51
37 Leonis	5½	0.63	7.1	14 17.1	19 5.6	+ 5 31.6	−1.0800	0.5755	0.1624	−29	−76
l Leonis	5½	+0.56	−6.4	+11 8.2	30 9 14.2	− 4 50.2	−0.3091	0.5719	−0.1799	+19	−51
B. A. C. 3837	6½	0.50	5.5	8 40.3	20 5.3	+ 5 37.9	+0.1738	0.5696	0.1908	+46	−24
ν Virginis	4	0.39	4.6	7 9.3	31 10 9.0	− 4 48.0	−1.0550	0.5670	0.2014	−25	−83
b Virginis	5½	+0.36	−3.7	+ 4 16.6	16 24.7	+ 1 14.6	+0.5790	0.5662	−0.2051	+75	− 4

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

FEBRUARY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1888.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	″	° ′	d h m	h m				°	°
c Virginis	5½	+0.28	− 3.2	+ 3 56.2	1 1 31.2	+10 2.1	−0.9594	0.5639	−0.2081	−18	−86
B. A. C. 4254	6	+0.20	− 2.4	+ 2 28.3	9 33.9	− 6 11.8	−1.1650	0.5637	0.2098	−34	−88
80 Virginis	6	−0.02	+ 0.9	− 4 49.5	2 11 6.1	− 5 32.4	+0.8618	0.5637	0.2061	+85	+12
88 Virginis	6½	0.08	1.5	6 16.7	16 47.6	− 0 2.7	+1.1630	0.5639	0.2033	+84	+35
ξ^1 Libræ	6	0.41	4.6	11 26.5	3 21 55.9	+ 4 4.5	+0.7651	0.5684	0.1799	+79	+ 6
ξ^2 Libræ	5½	−0.43	+ 4.4	−10 57.4	22 58.8	+ 5 5.1	+0.0861	0.5710	−0.1787	+37	−31
17 Libræ	7	0.44	4.4	10 42.1	23 38.3	+ 5 43.3	−0.2872	0.5711	0.1779	+17	−54
18 Libræ	6½	0.45	4.4	10 41.6	23 55.1	+ 5 59.5	−0.3462	0.5711	0.1775	+14	−57
B. A. C. 5070	6	0.59	4.8	11 58.0	4 10 44.7	− 7 34.0	−0.9086	0.5716	0.1645	−20	−90
γ Libræ	4½	0.63	5.8	14 24.8	15 43.7	− 2 45.8	+0 7729	0.5731	0.1579	+76	+ 7
η Libræ	6	−0.69	+ 6.0	−15 18.8	19 23.5	+ 0 46.1	+1.1200	0.5740	−0.1524	+75	+33
48 Libræ	5½	0.77	5.5	13 57.2	5 1 26.8	+ 6 36.3	−1.1610	0.5759	0.1431	−43	−90
49 Libræ	6	0.78	6.3	16 12.1	2 21.2	+ 7 28.7	+1.0000	0.5763	0 1421	+74	+23
ϕ Ophiuchi	4½	0.96	6.1	16 22.0	15 22.0	− 3 59.0	−0.5400	0.5797	0.1198	− 4	−74
24 Scorpii	5½	1.02	6.4	17 31.4	19 43.9	+ 0 13.2	+0.1362	0.5801	0.1123	+34	−29
29 Ophiuchi	6½	−1.13	+ 6.4	−18 43.1	6 4 11.7	+ 8 22.2	+0.4741	0.5816	−0.0966	+53	− 9
B. A. C. 6060	6	1.40	5.1	18 46.7	7 2 37.9	+ 5 58.1	−1.1290	0.5853	0.0508	−50	−90
B. A. C. 6098	6	1.44	5.4	20 44.0	5 22.1	+ 8 36.1	+0.7573	0.5862	0.0455	+69	+ 8
μ Sagittarii	4	1.50	5.1	21 5.2	9 58.4	−10 58.0	+0.9380	0.5864	0.0355	+69	+20
15 Sagittarii	5½	1.51	5.0	20 45.5	10 34.7	−10 22.9	+0.5776	0.5864	0.0339	+55	− 3
16 Sagittarii	6½	−1.51	+ 4 9	−20 25.1	10 35.3	−10 22.5	+0.2258	0.5864	−0.0338	+31	−23
21 Sagittarii	5	1.55	4.7	20 35.9	14 46.8	− 6 20.4	+0.2879	0.5853	0.0253	+34	−20
B. A. C. 6 36	6	1.60	4.5	21 29.3	19 58.0	− 1 20.9	+1.1070	0.5853	0.0140	+69	+35
B. A. C. 6347	6	1.61	4.4	21 8.4	20 23.1	− 0 56.7	+0.7425	0.5858	0.0128	+69	+ 7
29 Sagittarii	5½	1.64	3.8	20 27.0	8 0 52.4	+ 3 22.5	−0.0104	0.5855	−0.0033	+15	−37
33 Sagittarii	6	−1.67	+ 3.8	−21 29.7	2 39.3	+ 5 5.4	+1.0740	0.5857	+0.0003	+69	+32
ξ^1 Sagittarii	5½	1.67	3.5	20 48.0	4 3.6	+ 6 26.6	+0.3571	0.5852	0.0033	+36	−16
ξ^2 Sagittarii	3½	1.68	3.6	21 15.0	4 12.7	+ 6 35.3	+0.8235	0.5851	0.0038	+69	+12
Lalande 35497	6½	1.68	2.9	19 24.3	6 28.4	+ 8 45.9	−1.0810	0.5843	0.0087	−49	−90
B. A. C. 6536	5½	1.69	2.7	19 27.9	8 39.1	+10 51.8	−0.9982	0.5843	0.0128	−42	−90
π Sagittarii	3	−1.72	+ 3.0	−21 12.0	9 14.2	+11 25.6	+0.8177	0.5843	+0.0146	+69	+12
B. A. C. 6707	6½	1.77	1.3	19 5.9	20 29.2	− 1 44.4	−1.0780	0.5811	0.0384	−40	−90
f Sagittarii	5	1.80	0.9	20 1.8	9 0 41.1	+ 2 18.3	+0.0733	0.5799	0.0470	+23	−32
57 Sagittarii	6	1.80	+ 0.5	19 19.7	3 10.5	+ 4 42.3	−0.5375	0.5789	0.0516	−10	−74
σ Capricorni	5½	1.85	− 0.8	19 28.0	14 51.1	− 8 2.4	+0.3473	0.5750	0.0745	+42	−17
π Capricorni	5	−1.86	− 1.3	−18 34.7	18 18.6	− 4 42.4	−0.3193	0.5729	+0.0807	+ 5	−56
				NEW	*MOON.*						
ψ^1 Aquarii	4	1.63	9.1	9 41.9	13 1 22.7	− 0 14.4	+1.1030	0.5317	0.1792	+80	+30
χ Aquarii	5½	1.61	9.0	8 20.3	1 53.6	+ 0 15.6	−0.2802	0.5316	0.1794	+19	−53
B. A. C. 8274	7	−1.52	− 9.9	− 7 0.3	18 6.6	− 8 0.5	+1.2530	0.5252	+0.1875	+83	+44
27 Piscium	5	1.47	9.9	4 10.8	23 22.6	− 2 53.8	−0.8399	0.5234	0.1892	−11	−90
29 Piscium	5	1.45	9.9	3 39.2	14 1 1.0	− 1 18.2	−1.1080	0.5234	0.1900	−30	−90
4 Ceti	6	1.43	10.0	3 10.5	4 6.3	+ 1 41.6	−1.0440	0.5220	0.1907	−25	−90
5 Ceti	6	1.42	9.9	3 4.5	4 21.2	+ 1 56.1	−1.1060	0.5219	0.1907	−30	−90
14 Ceti	6	−1.32	−10.3	− 1 7.5	18 45.9	− 8 4.2	−0.4799	0.5175	+0.1928	+10	−67
15 Ceti	6½	1.31	10.2	− 1 7.5	20 7.2	− 6 45.2	−0.2198	0.5171	0.1928	+24	−49
26 Ceti	6	1.20	10.3	+ 0 45.8	15 9 49.9	+ 6 34.0	+0.3420	0.5151	0.1921	+57	−18
29 Ceti	6½	1.18	10.2	1 24.3	12 3.8	+ 8 44.2	+0.0625	0.5147	0.1918	+40	−33
33 Ceti	6	1.17	10.1	1 50.8	13 26.6	+10 4.6	−0.1600	0.5144	0.1914	+27	−45
35 Ceti	6½	−1.16	−10.1	+ 1 52.6	14 30.1	+11 6.3	+0.0110	0.5146	+0.1914	+37	−35
f Piscium	5	1.14	10.0	3 1.3	17 19.2	−10 9.4	−0.7164	0.5146	0.1910	− 3	−87
ν Piscium	4½	1.03	9.9	4 55.0	16 5 58.6	+ 2 8.5	−0.4189	0.5146	0.1873	+14	−61
64 Ceti	5½	0.88	9.2	8 2.5	21 56.9	− 6 20.4	−0.9466	0.5145	0.1798	−18	−82
ξ^1 Ceti	4½	0.87	9.2	8 19.1	22 48.8	− 5 30.0	−1.0950	0.5151	0.1792	−29	−82
ξ^2 Ceti	4½	−0.80	− 9.5	+ 7 57.3	17 6 51.7	+ 2 19.1	+0.7288	0.5162	+0.1744	+90	+ 6
B. A. C. 830	6	−0 72	− 8.8	+10 15.7	14 23.6	+ 9 37.9	−0.5296	0.5180	+0.1692	+ 7	−67

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

FEBRUARY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1888.0.		Apparent Declination	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	″	° ′	d h m	h m				°	°
μ Ceti	4½	−0.72	−9.0	+ 9 38.3	17 15 40.3	+10 52.4	+0.3764	0.5182	+0.1683	+59	−13
Lalande 5725	6	0.60	8.2	12 45.4	18 2 50.4	− 2 16.9	−1.2440	0.5217	0.1595	−45	−77
f Tauri	4	0.49	8.3	12 33.0	15 25.9	+ 9 56.1	+0.9175	0.5254	0.1472	+90	+22
48 Tauri	6	0.26	7.6	15 7.1	19 13 52.0	+ 7 41.2	+1.1180	0.5362	0.1220	+90	+40
γ Tauri	4	0.24	7.5	15 21.3	15 50.0	+ 9 35.6	+1.0940	0.5366	0.1192	+90	+38
δ^1 Tauri	4	−0.23	−6.9	+17 16.7	17 19.9	+11 2.6	−0.8393	0.5370	+0.1176	−12	−73
63 Tauri	6	0.22	7.1	16 30.7	17 35.2	+11 17.4	+0.0311	0.5375	0.1170	+38	−25
δ^2 Tauri	5½	0.22	6.9	17 10.9	17 54.1	+11 35.8	−0.6673	0.5378	0.1167	− 1	−70
δ^3 Tauri	5	0.21	6.7	17 40.1	18 34.2	−11 45.4	−1.1250	0.5384	0.1155	−35	−72
70 Tauri	6½	0.21	7.5	15 40.9	18 40.6	−11 39.2	+1.0680	0.5383	0.1155	+90	+37
75 Tauri	6½	−0.20	−7.3	+16 6.4	20 2.8	−10 19.6	+0.7573	0.5382	+0.1135	+90	+16
θ^1 Tauri	4	0.20	7.5	15 42.7	20 6.9	−10 15.7	+1.1980	0.5382	0.1135	+90	+50
B. A. C. 1391	5	0.19	7.4	15 56.9	21 4.4	− 9 19.9	+1.0470	0.5389	0.1122	+90	+35
α Tauri	1	0.16	7.3	16 16.9	23 39.9	− 6 49.4	+0.9690	0.5408	0.1088	+90	+30
B. A. C. 1468	6½	0.11	6.5	18 31.7	20 4 36.0	− 2 2.6	−0.9709	0.5432	0.1016	−22	−72
i Tauri	5½	−0.09	−6.5	+18 38.8	7 1.8	+ 0 18.5	−0.8545	0.5440	+0.0982	−14	−71
B. A. C. 1526	5½	0.06	7.1	16 58.5	9 55.5	+ 3 6.5	+1.2470	0.5462	0.0938	+90	+59
m Tauri	5½	−0.01	6.6	18 29.5	14 37.0	+ 7 38.9	+0.0145	0.5478	0.0861	+37	−23
119 Tauri	5	+0.12	6.7	18 30.4	21 2 10.3	− 5 10.7	+0.8884	0.5535	0.0676	+90	+29
120 Tauri	6	0.12	6.7	18 27.5	2 46.7	− 4 35.6	+0.9804	0.5540	0.0665	+90	+35
127 Tauri	6½	+0.16	−6.6	+18 55.4	7 3.6	− 0 27.3	+0.7464	0.5562	+0.0593	+90	+21
χ^1 Orionis	4½	0.22	6.3	20 15.1	12 15.8	+ 4 34.3	−0.4039	0.5593	0.0502	+13	−44
χ^2 Orionis	6	0.22	6.4	19 43.4	12 31.1	+ 4 49.1	+0.1777	0.5599	0.0494	+47	−10
χ^3 Orionis	6	0.26	6.4	19 41.4	16 21.4	+ 8 31.5	+0.3937	0 5606	0.0427	+62	+ 2
χ^4 Orionis	5	0.26	6.3	20 8.3	16 33.4	+ 8 43.1	−0.0831	0.5610	0.0419	+32	−24
68 Orionis	6	+0.29	−6.4	+19 48.8	20 11.6	−11 46.3	+0.4072	0.5623	+0.0357	+63	+ 4
71 Orionis	6	0.30	6.6	19 11.5	21 28.4	−10 32.1	+1.1160	0.5637	0.0330	+90	+50
15 Geminorum	6½	0.36	6.2	20 51.4	22 3 10.5	− 5 1.9	−0.5106	0.5659	0.0219	+ 7	−49
16 Geminorum	6½	0.36	6.2	20 33.7	3 15.4	− 4 57.2	−0.1940	0.5659	0.0219	+25	−28
ν Geminorum	4½	0.37	6.3	20 16.8	3 42.7	− 4 30.8	+0.1157	0.5663	+0.0208	+43	−10
ζ Geminor. *mult.*	4	+0.51	−6.3	+20 43.9	19 4.0	+10 17.8	−0.2751	0.5728	−0.0097	+20	−32
56 Geminorum	5½	0.57	6.4	21 39.2	23 2 45.7	− 6 17.0	−0.3264	0.5754	0.0254	+18	−36
61 Geminorum	6	0.59	6.5	20 28.7	4 54.2	− 4 13.2	−0.1996	0.5755	0.0298	+25	−29
79 Geminorum	6½	0.66	6.6	20 35.0	12 40.9	+ 3 16.5	−0.6011	0.5777	0.0456	+ 2	−58
85 Geminorum	6	0.69	6.7	20 10.6	17 9.7	+ 7 35.5	−0.4034	0.5791	0.0549	+13	−44
d^1 Cancri	6	+0.76	−7.1	+18 41.4	24 4 54.5	− 5 5.6	+0.3558	0.5813	−0.0791	+58	+ 3
θ Cancri	5½	0.78	7.2	18 28.2	8 23.1	− 1 44 7	+0.2943	0.5813	0.0862	+55	− 7
δ Cancri	4	0.81	7.2	18 33.8	13 53.9	+ 3 33.9	−0.3053	0.5816	0.0969	+19	−42
7 Leonis	6½	0.88	7.8	14 52.7	25 11 29.9	+ 0 22.0	+0.9268	0.5848	0.1380	+90	+25
ψ Leonis	6	0.90	7.9	14 31.9	14 48.5	+ 3 33.3	+0.8106	0.5820	0.1427	+90	+17
34 Leonis	6½	+0.91	−7.8	+13 54.4	26 2 36.3	− 9 4.9	−0.3535	0.5809	−0.1616	+17	−51
37 Leonis	5½	0.91	7.8	14 17.1	4 44.5	− 7 1.5	−1.0820	0.5804	0.1645	−29	−76
l Leonis	5½	0.93	7.5	11 8.2	18 36.8	+ 6 20.4	−0.3261	0.5790	0.1831	+19	−52
B. A. C. 3837	6½	0.91	7.3	8 40.3	27 5 12.8	− 7 26.6	+0.1400	0.5775	0.1942	+44	−26
ν Virginis	4	0.87	6.8	7 9.3	18 53.9	+ 5 44.8	−1.0830	0.5757	0.2053	−28	−83
b Virginis	5½	+0.86	−6.5	+ 4 16.6	28 0 58.8	+11 36 6	+0.5224	0.5749	−0.2088	+70	− 7
c Virginis	5½	0.83	6.0	3 56.1	9 48.8	− 3 52.4	−0.9965	0.5735	0.2124	−21	−86
B. A. C. 4254	6	0.80	5.5	+ 2 28.2	17 36.3	+ 3 38.3	−1.2050	0.5735	0.2143	−38	−88
80 Virginis	6	0.67	3.0	− 4 49.5	29 18 19.3	+ 3 28.4	+0.7711	0.5735	0.2103	+74	+ 6
88 Virginis	6½	+0.63	−2.4	− 6 16.7	23 50.1	+ 8 47.4	+1.0640	0.5733	−0.2073	+84	+27

MARCH.

ξ^1 Libræ	6	+0.38	+0.5	−11 26.5	2 4 9.2	−11 54.7	+0.6610	0.5757	−0.1826	+76	0
ξ^2 Libræ	5½	0.37	0.4	10 57.5	5 10.6	−10 55.6	−0.0083	0.5755	0.1815	+32	−37
17 Libræ	7	+0.36	+0.4	−10 42.2	5 48.8	−10 18.8	−0.3773	0.5757	−0.1805	+12	−60
18 Libræ	6½	+0.36	+0.6	−10 41.7	6 5.4	−10 2.7	−0.4374	0.5758	−0.1803	+ 9	−64

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MARCH.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1888.0. Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		s	″	° ′	d h m	h m				°	°
B. A. C. 5070	6	+0.24	+ 1.2	−11 58.1	2 16 40.6	+ 0 9.3	−1.0010	0.5781	−0.1668	−27	−90
γ Libræ	4½	0.20	2.2	14 24.9	21 33.6	+ 4 51.5	+0.6671	0.5790	0.1597	+73	+ 1
η Libræ	6	0.16	2.5	15 18.9	3 1 9.3	+ 8 19.3	+1.0120	0.5803	0.1539	+75	+24
48 Libræ	5½	0.06	2.4	13 57.3	7 6.8	− 9 56.3	−1.2540	0.5807	0.1447	−54	−90
49 Libræ	6	+0.07	3.1	16 12.2	8 0.4	− 9 4.7	+0.8921	0.5807	0.1432	+74	+15
φ Ophiuchi	4½	−0.11	+ 3.4	−16 22.0	20 51.7	+ 3 18.0	−0.6406	0.5820	−0.1209	− 9	−84
24 Scorpii	5½	0.16	3.8	17 31.4	4 1 11.2	+ 7 27.8	+0.0322	0.5820	0.1126	+27	−34
29 Ophiuchi	6½	0.27	4.2	18 43.1	9 35.9	− 8 26.3	+0.3713	0.5831	0.0964	+46	−15
B. A. C. 6060	6	0.58	4.0	18 46.7	5 8 2.0	−10 50.5	−1.2280	0.5835	0.0507	−60	−90
B A. C. 6098	6	0.63	4.5	20 44.0	10 46.9	− 8 11.7	+0.6592	0.5833	0.0447	+63	+ 1
μ Sagittarii	4	−0.70	+ 4.5	−21 5.2	15 24.6	− 3 44.5	+0.8445	0.5833	−0.0347	+69	+13
15 Sagittarii	5½	0.70	4.4	20 45.5	16 1.4	− 3 9.0	+0.4835	0.5831	0.0337	+48	− 9
16 Sagittarii	6½	0.70	4.2	20 25.1	16 1.9	− 3 8.6	+0.1312	0.5831	0.0337	+25	−29
21 Sagittarii	5	0.75	4.2	20 35.9	20 15.1	+ 0 55 2	+0.1937	0.5826	0.0247	+28	−25
B. A. C. 6336	6	0.83	4.3	21 29.3	6 1 29.2	+ 5 57.7	+1.0220	0.5812	0.0130	+69	+27
B. A. C. 6347	6	−0.83	+ 4.1	−21 8.4	1 54.5	+ 6 22.0	+0.6549	0.5812	−0.0125	+60	+ 1
29 Sagittarii	5½	0.89	3.6	20 27.0	6 26.6	+10 44.0	−0.0990	0.5804	−0.0028	+10	−42
33 Sagittarii	6	0.91	3.9	21 29.7	8 14.6	−11 31.9	+0.9879	0.5798	+0.0012	+69	+24
ξ^1 Sagittarii	5½	0.93	3.6	20 48.0	9 40.0	−10 9.7	+0.2678	0.5798	0.0042	+31	−21
ξ^2 Sagittarii	3½	0.93	3.7	21 15.0	9 49.3	−10 0.7	+0.7389	0.5798	0.0043	+69	+ 7
Lalande 35497	6½	−0.94	+ 3.0	−19 24.4	12 6 5	− 7 48.6	−1.1680	0.5788	+0.0092	−57	−90
B. A. C. 6536	5½	0.97	2.9	19 27.9	14 18.7	− 5 41.2	−1.0840	0.5786	0.0136	−49	−90
π Sagittarii	3	0.99	3.3	21 11.9	14 54.3	− 5 6.9	+0.7352	0.5782	0.0150	+69	+ 6
B. A. C. 6707	6½	1.11	2.0	19 5.9	7 2 18.9	+ 5 52.8	−1.1610	0.5753	0.0382	−54	−90
f Sagittarii	5	1.16	1.9	20 1.8	6 34.5	+ 9 59.1	0.0000	0.5738	0.0472	+20	−36
57 Sagittarii	6	−1.18	+ 1.5	−19 19.7	9 6.4	−11 34.4	−0.6124	0.5724	+0.0519	−14	−85
σ Capricorni	5½	1.29	0.6	19 28.0	20 58.5	− 0 7.6	+0 2821	0.5679	0.0743	+38	−20
π Capricorni	5	1.31	+ 0.1	18 34.7	8 0 29.7	+ 3 16.2	−0.3851	0.5666	0.0811	+ 2	−61
ρ Capricorni	5½	1.31	− 0.1	18 10.9	1 11.2	+ 3 56.2	−0.7473	0.5662	0.0821	−19	−90
ϕ Capricorni	6	1.32	0.0	18 57.1	1 38.0	+ 4 22.1	+0.1042	0.5658	0.0830	+28	−30
υ Capricorni	5½	−1.32	0.0	−18 32.0	6 9.9	+ 8 44.5	+0.0531	0.5637	+0.0906	+27	−33
19 Capricorni	6	1.40	− 1.1	18 20.8	12 48.3	− 8 50.8	+0.4974	0.5615	0.1022	+55	− 8
21 Capricorni	6½	1.41	1.3	17 57.9	15 33.6	− 6 11.1	+0.3766	0.5597	0.1067	+48	−15
θ Capricorni	4	1.42	1.6	17 40.6	17 52.7	− 3 56.7	+0.3220	0.5589	0.1102	+44	−18
31 Capricorni	6½	1.46	2.0	17 55.9	23 31.8	+ 1 31.0	+1.2430	0.5563	0.1190	+72	+49
ι Capricorni	4½	−1.47	− 2.3	−17 18.7	9 1 22.7	+ 3 18.2	+0.8023	0.5550	+0.1216	+73	+10
Venus				15 55.3	4 27.0	+ 6 16.4	−0.3059	0.4234	0.0892	+10	−55
42 Capricorni	5½	1.49	3.8	14 32.9	10 26.1	−11 56.4	−1.0000	0.5508	0.1344	−29	−90
44 Capricorni	6	1.49	3.7	14 54.8	11 8.5	−11 15.4	−0.5135	0.5505	0.1354	+ 1	−71
45 Capricorni	6½	1.50	3.7	15 15.8	11 34.9	−10 49.8	−0.0805	0.5500	0.1356	+24	−41
μ Capricorni	5	−1.50	− 4.3	−14 4.8	15 58.2	− 6 35.1	−0.7437	0.5482	+0.1413	−12	−90
ι Aquarii	4½	1.52	4.8	14 24.9	22 16.1	− 0 29.4	+0.5314	0.5450	0.1487	+63	− 8
39 Aquarii	6½	1.53	5.0	14 44.8	10 1 9.2	+ 2 18.2	+1.3250	0.5437	0.1523	+75	+68
42 Aquarii	5½	1.53	5.3	13 23.4	3 17.3	+ 4 22.1	+0.1871	0.5425	0.1545	+41	−26
45 Aquarii	6½	1.54	5.4	13 52.0	4 21.2	+ 5 24.1	+0.8702	0.5425	0.1557	+76	+13
σ Aquarii	5	−1.54	− 6.1	−11 15.2	10 4.1	+10 56.3	−1.0510	0.5398	+0.1615	−30	−90
				NEW	*MOON.*						
26 Ceti	6	1.39	10.6	+ 0 45.8	13 17 19.6	− 8 8.6	+0.4458	0.5163	0.1940	+64	−12
29 Ceti	6½	1.38	10.6	1 24.3	19 33.4	− 5 58.6	+0.1694	0.5158	0.1934	+46	−27
33 Ceti	6	−1.37	−10.7	+ 1 50.8	20 56.1	− 4 38.2	−0.0846	0.5156	+0.1932	+32	−41
35 Ceti	6½	1.37	10.7	1 52.6	21 59.5	− 3 36.7	+0.1179	0.5154	0.1931	+43	−30
f Piscium	5	1.35	10.6	3 1.3	14 0 48.4	− 0 52.5	−0.6070	0.5162	0.1927	+ 3	−77
ν Piscium	4½	1.29	10.6	4 55.0	13 26.7	+11 24.3	−0.2934	0.5153	0.1886	+21	−53
64 Ceti	5½	1.21	10.2	8 2.5	15 5 23.6	+ 2 54.0	−0.8056	0.5172	0.1816	− 8	−82
ξ^1 Ceti	4½	−1.21	−10.2	+ 8 19.1	6 15.6	+ 3 44.4	−0.9557	0.5172	+0.1811	−18	−82
ξ^2 Ceti	4½	−1.16	−10.3	+ 7 57.3	14 18.1	+11 33.2	+0.8853	0.5181	+0.1761	+90	+16

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MARCH.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1888.0. $\Delta\alpha$	$\Delta\delta$	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		s	″	° ′	d h m	h m				°	°
B. A. C. 830	6	−1.11	− 9.9	+10 15.6	15 21 49.8	− 5 8.2	−0.3722	0.5195	+0.1704	+16	−56
μ Ceti	4½	1.10	10.0	9 38.2	23 6.9	− 3 53.3	+0.5389	0.5196	0.1696	+72	− 4
Lalande 5725	6	1.03	9.3	12 45.3	16 10 17.7	+ 6 58.0	−1.1820	0.5223	0.1606	−38	−77
f Tauri	4	0.93	9.3	12 32.9	22 55.7	− 4 46.4	+1.1020	0.5256	0.1481	+90	+35
γ Tauri	4	0.72	8.2	15 21.3	17 23 30.0	− 4 56.7	+1.2920	0.5369	0.1196	+90	+64
δ^1 Tauri	4	−0 71	− 7.6	+17 16.7	18 1 1.0	− 3 28.6	−0.6563	0.5369	+0.1171	0	−69
63 Tauri	6	0.71	7.8	16 30.7	1 16.2	− 3 13.9	+0.2188	0.5346	0.1169	+50	−15
δ^2 Tauri	5½	0.71	7.6	17 10.9	1 35.4	− 2 55.2	−0.4835	0.5346	0.1161	+ 9	−56
δ^3 Tauri	5	0.71	7.5	17 40.1	2 16.0	− 2 15.9	−0.9432	0.5351	0.1156	−19	−72
70 Tauri	6½	0.70	8.1	15 40.9	2 22.4	− 2 9.7	+1.2610	0.5351	0.1154	+90	+58
75 Tauri	6½	−0.68	− 7.9	+16 6.4	3 45.5	− 0 49.1	+0.9524	0.5357	+0.1134	+90	+28
B. A. C. 1391	5	0.68	7.9	15 56.9	4 47.9	+ 0 11.3	+1.2430	0.5362	0.1119	+90	+56
a Tauri	1	0.65	7.8	16 16.9	7 25.1	+ 2 43 5	+1.1630	0.5367	0.1081	+90	+46
B. A. C. 1468	6½	0.61	7.1	18 31.7	12 24.8	+ 7 33.9	−0.7872	0.5398	0.1012	− 9	−71
i Tauri	5½	0.59	7.0	18 38.8	14 52.6	+ 9 57.0	−0.6704	0.5403	0.0976	− 2	−68
m Tauri	5½	−0.52	− 7.0	+18 29.5	22 34.3	− 6 36.0	+0.2065	0.5436	+0.0859	+49	−12
119 Tauri	5	0.39	6 9	18 30.4	19 10 19.1	+ 4 45.9	+1.0850	0.5480	0.0672	+90	+46
120 Tauri	6	0.39	6.9	18 27 5	10 56.0	+ 5 21.5	+1.1790	0.5488	0.0660	+90	+52
127 Tauri	6½	0.34	6.7	18 55.4	15 17.8	+ 9 34 7	+0.9419	0.5503	0.0586	+90	+33
χ^1 Orionis	4½	0.27	6.1	20 15 1	20 36.1	− 9 17.6	−0.2192	0.5531	0.0490	+24	−32
χ^2 Orionis	6	−0.28	− 6.3	+19 43.4	20 51.7	− 9 2.5	+0.3677	0.5531	+0.0487	+60	0
χ^3 Orionis	6	0.24	6.2	19 41.4	20 0 46.6	− 5 15.4	+0.5805	0.5547	0.0416	+79	+12
χ^4 Orionis	5	0.23	6.1	20 8.3	0 58.8	− 5 3.7	+0.1030	0.5549	0.0414	+43	−13
68 Orionis	6	0.19	6.1	19 48.8	4 41.7	− 1 28.3	+0.5938	0.5563	0.0347	+80	+14
15 Geminorum	6½	0.12	5.6	20 51.4	11 49.6	+ 5 25.1	−0 3327	0.5591	0 0212	+17	−36
16 Geminorum	6½	−0.11	− 5.7	+20 33.7	11 54.6	+ 5 29.9	−0.0144	0.5591	+0.0212	+36	−17
ν Geminorum	4½	−0.11	5.8	20 16.8	12 22.5	+ 5 56.9	+0.3003	0.5595	+0.0202	+55	0
ζ Geminor. *mult.*	4	+0.07	5.4	20 43.9	21 4 5.2	− 2 53.1	−0.1034	0.5649	−0.0102	+31	−22
56 Geminorum	5½	0.16	5.4	20 39.2	11 58.1	+ 4 43.3	−0.1596	0.5670	0.0257	+27	−26
61 Geminorum	6	0.18	5.4	20 28.7	14 9.7	+ 6 50.3	−0.0354	0.5676	0.0299	+34	−20
79 Geminorum	6½	+0.26	− 5.4	+20 35.0	22 7.7	− 9 28.7	−0.4489	0.5694	−0 0460	+11	−46
85 Geminorum	6	0.32	5.4	20 10.6	22 2 42.8	− 5 3 3	−0.2491	0.5699	0.0552	+22	−34
d^1 Cancri	6	0.43	5.8	18 41.4	14 44.0	+ 6 31.9	+0.5008	0.5697	0.0789	+71	+ 5
θ Cancri	5½	0.47	5.9	18 28.2	18 17.2	+ 9 57.5	+0.4357	0.5733	0.0859	+65	+ 1
δ Cancri	4	0.53	5.8	18 33.8	23 54.9	− 8 37.0	−0.1765	0.5741	0.0969	+26	−34
7 Leonis	6½	+0.73	− 6.6	+14 52.7	23 21 54.6	−11 25.2	+1.0300	0.5769	−0.1374	+90	+32
8 Leonis	5½	0.73	6.1	16 56.2	22 22.6	−10 58.2	−1.1390	0.5772	0.1380	−35	−73
ψ Leonis	6	0.75	6.7	14 31.9	24 1 16.0	− 8 11.0	+0.9131	0.5772	0.1431	+90	+23
34 Leonis	6½	0.85	6.7	13 54.4	13 12.2	+ 3 19.2	−0.2766	0.5772	0.1619	+21	−46
37 Leonis	5½	0.86	6.6	14 17.1	15 21.5	+ 5 23.7	−1.0120	0.5772	0.1650	−23	−76
l Leonis	5½	+0.95	− 7.1	+11 8.2	25 5 18.9	− 5 9.3	−0.2793	0.5772	−0.1841	+21	−49
B. A. C. 3837	6½	1.00	7.2	8 40.3	15 55.5	+ 5 4.2	+0.1694	0.5772	0.1960	+46	−25
ν Virginis	4	1.05	6.9	7 9.3	26 5 32.4	− 5 48.5	−1.0770	0.5775	0.2081	−27	−83
b Virginis	5½	1.08	6.9	4 16.6	11 33.9	− 0 0.1	+0.5089	0.5776	0.2118	+69	− 8
c Virginis	5½	1.09	6.6	3 56.1	20 17.1	+ 8 24.0	−1.0210	0.5782	0.2163	−22	−86
B. A. C 4254	6	+1.10	− 6.4	+ 2 28.2	27 3 56.9	− 8 12.7	−1.2410	0.5782	−0.2181	−42	−88
65 Virginis	6	1.11	5.4	− 4 20.4	22 57.3	+10 5.8	+1.2990	0.5808	0.2173	+86	+50
80 Virginis	6	1.10	5.1	4 49.6	28 4 5.7	− 8 57.2	+0.6661	0.5820	0.2154	+82	0
88 Virginis	6½	1.10	4.6	6 16.8	9 27.1	− 3 47.6	+0.9460	0.5826	0.2126	+84	+17
ξ^1 Libræ	6	0.99	1.9	11 26.5	29 12 51.4	− 1 24.7	+0.4991	0.5865	0.1875	+64	− 9
ξ^2 Libræ	5½	+0.98	− 1.9	−10 57.5	13 50.5	− 0 27.8	−0.1626	0 5865	−0.1862	+24	−46
17 Libræ	7	0.98	1.9	10 42.2	14 27.5	+ 0 7.8	−0.5271	0.5865	0.1856	+ 4	−71
18 Libræ	6½	0.97	1.9	10 41.7	14 43.4	+ 0 23.1	−0.5845	0.5865	0.1850	+ 1	−77
B. A. C. 5070	6	0.91	1.0	11 58.1	30 0 56.5	+10 13.0	−1.1520	0.5882	0.1710	−39	−90
γ Libræ	4½	0.89	− 0.2	14 24.9	5 38.7	− 9 15.6	+0.4800	0.5892	0.1637	+60	−10
η Libræ	6	+0.86	+ 0.2	−15 18.9	9 6.8	− 5 55.5	+0.8149	0.5898	−0.1584	+75	+10
θ Libræ	4½	+0.84	+ 0.7	−16 24.0	13 2.7	− 2 8.5	+1.2840	0.5906	−0.1517	+74	+55

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MARCH.

THE STAR'S					AT CONJUNCTION IN R. A.					LIMITING PARALLELS.	
Name.	Mag.	Red'ns from 1888.0. Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle Π	Y	x′	y′	N.	S.
		s	″	° ′	d h m	h m				°	°
49 Libræ	6	+0.81	+0.8	−16 12.2	30 15 43.2	+ 0 25.8	+0.6931	0.5912	−0.1469	+73	+ 2
χ Ophiuchi	4½	0.71	2.1	18 12.1	31 2 26.3	+10 44.2	+1.2200	0.5916	0.1269	+72	+45
φ Ophiuchi	4½	0.68	1.7	16 22.1	4 7.9	−11 38.1	−0.8250	0.5916	0.1239	−20	−90
24 Scorpii	5½	0.63	2.2	17 31.5	8 18.8	− 7 36.9	−0.1688	0.5924	0.1157	+16	−47
29 Ophiuchi	6½	+0.54	+2.8	−18 43.2	16 27.3	+ 0 12.7	+0.1611	0.5923	−0.0985	+33	−27

APRIL.

B. A. C. 6098	6	+0.22	+4.2	−20 44.0	1 16 56.5	− 0 14.7	+0.4370	0.5892	−0.0454	+45	−12
μ Sagittarii	4	0.16	4.4	21 5.2	21 27.7	+ 4 6.1	+0.6177	0.5884	0.0350	+59	− 1
15 Sagittarii	5½	+0.16	+4.3	−20 45.5	22 3.6	+ 4 40.7	+0.2610	0.5884	−0.0341	+33	−22
16 Sagittarii	6½	0.16	4.2	20 25.1	22 4.2	+ 4 41.2	−0.0870	0.5884	0.0340	+13	−42
21 Sagittarii	5	0.10	4.3	20 35.9	2 2 12.0	+ 8 39.5	−0.0256	0.5871	0.0316	+15	−38
B. A. C. 6336	6	0.03	4.6	21 29.3	7 19.8	−10 24.3	+0.7941	0.5861	0.0136	+69	+10
B. A. C. 6347	6	+0.03	4.4	21 8.4	7 44.7	−10 0.3	+0.4330	0.5861	0.0124	+42	−12
29 Sagittarii	5½	−0.04	+4.2	−20 27.0	12 11.9	− 5 43.2	−0.3132	0.5844	−0.0024	− 2	−56
33 Sagittarii	6	0.06	4.6	21 29.7	13 58.2	− 4 0.9	+0.7671	0.5841	+0.0014	+69	+ 8
ξ¹ Sagittarii	5½	0.09	4.3	20 48.0	15 22.1	− 2 40.2	+0.0517	0.5833	0.0041	+18	−33
ξ² Sagittarii	3½	0.09	4.5	21 15.0	15 31.2	− 2 31.5	+0.5172	0.5831	0.0050	+48	− 7
o Sagittarii	3½	0.14	4.6	21 54.2	18 23.7	+ 0 14.6	+1.2200	0.5824	0.0112	+68	+49
π Sagittarii	3	−0.16	+4.4	−21 11.9	20 32.0	+ 2 18.2	+0.5172	0.5817	+0.0330	+50	− 7
f Sagittarii	5	0.36	3.5	20 1.7	3 12 1.9	− 6 46.1	−0.2076	0.5745	0.0477	+ 8	−49
57 Sagittarii	6	0.39	3.2	19 19.6	14 32.5	− 4 20.8	−0.8198	0.5736	0.0530	−26	−90
σ Capricorni	5½	0.55	2.7	19 28.0	4 2 21.3	+ 7 2.6	+0.0827	0.5680	0.0752	+26	−32
π Capricorni	5	0.58	2.3	18 34.7	5 51.8	+10 25.6	−0.5791	0.5652	0.0817	− 9	−78
ρ Capricorni	5½	−0.59	+2.1	−18 10.9	6 33.2	+11 5.5	−0.9434	0.5652	+0.0830	−31	−90
o Capricorni	6	0.60	2.4	18 57.1	7 0.0	+11 31.4	−0.0899	0.5652	0.0836	+18	−42
υ Capricorni	5½	0.65	2.0	18 32.0	11 31.6	− 8 6.4	−0.1395	0.5622	0.0919	+16	−45
19 Capricorni	6	0.72	1.6	18 20.8	18 10.5	− 1 41.2	+0.2749	0.5590	0.1027	+41	−21
21 Capricorni	6½	0.74	1.4	17 57.9	20 56.3	+ 0 58.9	+0.1954	0.5576	0.1073	+36	−25
θ Capricorni	4	−0.77	+1.1	−17 40.6	23 15.6	+ 3 13.5	+0.1404	0.5560	+0.1105	+34	−28
31 Capricorni	6½	0.83	0.8	17 55.9	5 4 56.2	+ 8 42.7	+1.0690	0.5533	0.1195	+72	+29
ι Capricorni	4½	0.85	+0.5	17 18.7	6 47.8	+10 30.6	+0.6292	0.5518	0.1221	+75	− 1
42 Capricorni	5½	0.91	−0.8	14 32.8	15 54.4	− 4 40.8	−1.1650	0.5476	0.1348	−44	−90
45 Aquarii	6½	1.05	2.2	13 51.9	6 9 58.7	−11 11.0	+0.7345	0.5378	0.1563	+75	+ 4
B. A. C. 7835	6½	−1.09	−2.6	−13 29.4	15 24.6	− 5 55.2	+1.1930	0.5353	+0.1618	+77	+39
σ Aquarii	5	1.08	3.2	11 15.2	15 44.9	− 5 35.6	−1.1770	0.5352	0.1618	−41	−90
58 Aquarii	6½	1.08	3.2	11 28.8	16 15.6	− 5 5.9	−0.8480	0.5352	0.1624	−16	−90
70 Aquarii	6	1.14	3.8	11 8.9	7 0 40.6	+ 3 3.7	+0.1888	0.5316	0.1700	+44	−26
Lalande 44734	6½	1.15	4.0	10 39.4	2 48.3	+ 5 7.6	+0.0182	0.5299	0.1719	+34	−36
ψ¹ Aquarii	4	−1.21	−5.1	− 9 41.9	14 36.7	− 7 25.3	+1.0540	0.5254	+0.1803	+80	+25
χ Aquarii	5½	1.20	5.5	8 20.3	15 8.1	− 6 54.8	−0.3370	0.5254	0.1805	+16	−57
B. A. C. 8274	7	1.26	6.6	7 0.2	8 7 37.6	+ 9 5.6	+1.2570	0.5211	0.1894	+83	+44
27 Piscium	5	1.26	7.3	4 10.7	12 58.1	− 9 43.1	−0.8312	0.5200	0.1916	−10	−90
29 Piscium	5	1.26	7.4	3 39.1	14 37.8	− 8 6.4	−1.0910	0.5194	0.1920	−28	−90
4 Ceti	6	−1.27	−7.7	− 3 10.4	17 45.6	− 5 3.9	−1.0160	0.5184	+0.1929	−22	−90
5 Ceti	6	1.27	7.7	− 3 4.4	18 0.5	− 4 49.5	−1.0790	0.5186	0.1929	−27	−90
				NEW	*MOON.*						
μ Ceti	4½	1.27	10.0	+ 9 38.2	12 5 38.6	+ 4 25.9	+0.6847	0.5206	0.1718	+88	+ 4
Lalande 5725	6	−1.24	−9.7	+12 45.3	16 49.2	− 8 42.9	−0.9147	0.5238	+0.1626	−16	−77
f Tauri	4	1.20	9.5	12 32.9	13 5 26.9	+ 3 32.3	+1.2910	0.5264	0.1499	+90	+58
B. A. C. 1272	6	1.12	8.5	17 2.3	14 0 8.2	− 2 20.2	−1.0870	0.5327	0.1283	−30	−73
δ¹ Tauri	4	1.08	8.3	17 16.7	7 33.3	+ 4 51.2	−0.4382	0.5358	0.1188	+12	−53
63 Tauri	6	1.08	8.4	16 30.7	7 48.6	+ 5 6.1	+0.4438	0.5358	0.1184	+66	− 3
δ² Tauri	5½	−1.08	−8.3	+17 10.9	8 7.8	+ 5 24.7	−0.2620	0.5347	+0.1178	+22	−42
δ³ Tauri	5	−1.07	−8.1	+17 40.1	8 48.6	+ 6 4.2	−0.7196	0.5353	+0.1168	− 4	−72

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

APRIL.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1888.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	″	° ′	d h m	h m				°	°
75 Tauri	6½	−1.06	−8.5	+16 6.4	14 10 18.2	+ 7 31.1	+1.1810	0.5357	+0.1152	+90	+47
B. A. C. 1468	6½	1.01	7.7	18 31.7	18 59.2	− 8 4.2	−0.5545	0.5388	0.1024	+ 6	−60
i Tauri	5½	1.00	7.6	18 38.8	21 27.5	− 5 40.6	−0.4347	0.5401	0.1008	+13	−51
m Tauri	5½	0.94	7.4	18 29.5	15 5 11.7	+ 1 48.9	+0.4540	0.5426	0.0872	+67	+ 1
127 Tauri	6½	0.80	6.8	18 55.4	22 3.1	− 5 52.4	+1.2070	0.5483	0.0590	+90	+56
χ^1 Orionis	4½	−0.76	−6.2	+20 15.1	16 3 24.7	− 0 41.5	+0.0420	0.5500	+0.0493	+39	−17
χ^2 Orionis	6	0.76	6.4	19 43.4	3 40.5	− 0 26.1	+0.6333	0.5500	0.0491	+85	+15
χ^3 Orionis	6	0.72	6.3	19 41.4	7 38.1	+ 3 23.6	+0.8488	0.5508	0.0423	+90	+28
χ^4 Orionis	5	0.72	6.2	20 8.3	7 50.6	+ 3 35.7	+0.3679	0.5511	0.0417	+61	+ 1
68 Orionis	6	0.68	6.1	19 48.8	11 36.4	+ 7 14.0	+0.8656	0.5521	0.0347	+90	+30
15 Geminorum	6½	−0.62	−5.5	+20 51.4	18 50.4	− 9 46.5	−0.0672	0.5547	+0.0216	+33	−21
16 Geminorum	6½	0.61	5.6	20 33.7	18 55.4	− 9 41.7	+0.2560	0.5547	0.0216	+52	− 3
ν Geminorum	4½	0.61	5.6	20 16.8	19 23.8	− 9 14.2	+0.5718	0.5552	0.0206	+78	+14
d Geminorum	6	0.51	4.7	21 53.5	17 5 40.2	+ 0 41.3	−1.0650	0.5571	+0.0013	−30	−68
ζ Geminor. *mult.*	4	0.44	5.0	20 43.9	11 23.3	+ 6 12.7	+0.1578	0.5571	−0.0100	+46	− 7
56 Geminorum	5½	−0.34	−4.8	+20 39.2	19 25.9	−10 1.2	+0.1095	0.5607	−0.0256	+43	−11
61 Geminorum	6	0.32	4.8	20 28.7	21 40.4	− 7 51.3	+0.2348	0.5607	0.0298	+51	− 5
63 Geminorum	5½	0.32	4.3	21 40.2	22 0.8	− 7 31.7	−1.0570	0.5610	0.0305	−30	−68
79 Geminorum	6½	0.23	4.4	20 35.0	18 5 49.8	+ 0 1.1	−0.1837	0.5619	0.0456	+26	−29
85 Geminorum	6	0.18	4.5	20 10.6	10 31.7	+ 4 33.3	+0.0142	0.5628	0.0551	+38	−19
Saturn				+20 45.0	19 20.8	−10 56.1	−1.1520	0.5603	−0.0397	−40	−69
d^1 Cancri	6	−0.01	−4.6	18 41.4	22 52.3	− 7 31.9	+0.7726	0.5645	0.0785	+90	+20
θ Cancri	5½	+0.03	4.5	18 28.2	19 2 31.4	− 4 0.5	+0.7042	0.5645	0.0853	+90	+16
35 Cancri	6½	0.04	3.7	19 58.4	4 8.8	− 2 26.5	−1.0270	0.5650	0.0886	−26	−70
ε Cancri	6½	0.07	3.9	19 56.5	6 25.1	− 0 15.0	−1.1970	0.5650	0.0930	−44	−70
δ Cancri	4	+0.10	−4.3	+18 33.8	8 18.9	+ 1 34.9	+0.0772	0.5650	−0.0948	+41	−20
80 Cancri	6½	0.23	4.0	18 30.1	20 21.9	−10 47.6	−1.1450	0.5659	0.1176	−36	−71
83 Cancri	5½	0.27	4.0	18 10.7	23 28.8	− 7 47.1	−1.1830	0.5665	0.1235	−40	−72
7 Leonis	6½	0.37	4.9	14 52.7	20 6 58.4	− 0 33.4	+1.2760	0.5665	0.1359	+90	+59
8 Leonis	5½	0.36	4.2	16 56.2	7 26.4	− 0 6.4	−0.9189	0.5665	0.1370	−17	−73
ψ Leonis	6	+0.41	−4.9	+14 31.9	10 26.1	+ 2 47.1	+1.1520	0.5665	−0.1419	+90	+42
34 Leonis	6½	0.54	4.8	13 54.4	22 43.9	− 9 21.1	−0.0701	0.5665	0.1609	+33	−34
37 Leonis	5½	0.56	4.8	14 17.1	21 0 57.1	− 7 12.7	−0.8191	0.5665	0.1641	−10	−76
l Leonis	5½	0.71	5.3	11 8.2	15 18.2	+ 6 38.1	−0.1014	0.5671	0.1829	+31	−39
B. A. C. 3837	6½	0.82	5.7	8 40.3	22 2 11.0	− 6 52.1	+0.3277	0.5690	0.1956	+56	−16
ν Virginis	4	+0.96	−5.6	+ 7 9.3	16 6.1	+ 6 33.4	−0.9585	0.5701	−0.2079	−18	−83
b Virginis	5½	1.02	6.0	4 16.6	22 14.3	−11 31.5	+0.6219	0.5715	0.2121	+80	− 2
c Virginis	5½	1.09	5.7	3 56.1	23 7 5.5	− 2 59.4	−0.9372	0.5722	0.2167	−16	−87
B. A. C. 4254	6	1.14	5.7	+ 2 28.2	14 50.9	+ 4 29.3	−1.1780	0.5742	0.2193	−35	−88
80 Virginis	6	1.29	5.2	− 4 49.6	24 15 5.6	+ 3 51.0	+0.6639	0.5813	0.2180	+82	− 1
88 Virginis	6½	+1.32	−5.0	− 6 16.8	20 26.0	+ 8 59.6	+0.9266	0.5835	−0.2158	+84	+15
ξ^1 Libræ	6	1.40	3.0	11 26.5	25 23 31.0	+11 3.1	+0.4056	0.5925	0.1919	+57	−15
ξ^2 Libræ	5½	1.40	2.9	10 57.5	26 0 29.0	+11 59.0	−0.2524	0.5928	0.1905	+19	−52
17 Libræ	7	1.40	2.8	10 42.2	1 5.4	−11 26.1	−0.6156	0.5928	0.1901	0	−80
18 Libræ	6½	1.40	2.8	10 41.7	1 21.0	−11 11.1	−0.6743	0.5929	0.1899	− 4	−87
γ Libræ	4½	+1.40	−1.3	−14 24.9	15 56.5	+ 2 50.3	+0.3458	0.5971	−0.1684	+50	−18
η Libræ	6	1.40	0.8	15 18.9	19 19.2	+ 6 5.1	+0.6683	0.5983	0.1631	+72	0
θ Libræ	4½	1.39	0.6	16 24.0	23 8.8	+ 9 45.7	+1.1230	0.5991	0.1561	+74	+33
49 Libræ	6	1.37	−0.1	16 12.2	27 1 44.8	−11 44.5	+0.5319	0.6001	0.1515	+62	− 7
χ Ophiuchi	4½	1.34	+1.2	18 12.1	12 8.5	− 1 45.6	+1.0290	0.6015	0.1313	+72	+25
φ Ophiuchi	4½	+1.31	+1.0	−16 22.1	13 46.9	− 0 11.1	−0.9899	0.6022	−0.1279	−30	−90
24 Scorpii	5½	1.30	1.5	17 31.5	17 49.6	+ 3 41.9	−0.3509	0.6029	0.1194	+ 7	−59
29 Ophiuchi	6½	1.25	2.4	18 43.2	28 1 41.6	+11 15.0	−0.0380	0.6033	0.1021	+22	−39
B. A. C. 6098	6	1.03	4.5	20 44.0	29 1 18.7	+ 9 55.7	+0.1972	0.6002	0.0474	+30	−25
μ Sagittarii	4	0.98	4.9	21 5.2	5 40.3	− 9 53.5	+0.3692	0.5994	0.0370	+40	−16
14 Sagittarii	6	+0.99	+5.1	−21 44.4	5 51.4	− 9 42.8	+1.0200	0.5994	−0.0365	+68	+26
15 Sagittarii	5½	+0.98	+4.8	−20 45.5	6 14.9	− 9 20.2	+0.0185	0.6001	−0.0357	+19	−36

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

APRIL.

The Star's Name.	Mag.	Red'ns from 1888.0. Δα	Red'ns from 1888.0. Δδ	Apparent Declination.	At Conjunction in R. A. Washington Mean Time.	Hour Angle H	Y	x′	y′	Limiting Parallels. N.	Limiting Parallels. S.
		s	″	° ′	d h m	h m				°	°
16 Sagittarii	6½	+0.98	+4.7	−20 25.1	29 6 15.4	− 9 19.8	−0.3243	0.6001	−0.0357	+ 1	−57
21 Sagittarii	5	0.93	5.0	20 35.9	10 14.5	− 5 30.2	−0.2660	0.5981	0.0259	+ 2	−53
B. A. C. 6536	6	0.87	5.5	21 29.3	15 11.5	− 0 44.9	+0.5337	0.5969	0.0143	+50	− 6
B. A. C. 6347	6	0.86	5.4	21 8.4	15 35.5	− 0 21.8	+0.1757	0.5964	0.0134	+26	−27
29 Sagittarii	5½	0.80	5.4	20 27.0	19 53.4	+ 3 46.0	−0.5610	0.5953	0.0034	−15	−77
31 Sagittarii	6½	+0.80	+5.9	−22 3.0	20 50.6	+ 4 41.0	+1.0640	0.5942	−0.0010	+68	+30
33 Sagittarii	6	0.79	5.8	21 29.7	21 36.1	+ 5 24.7	+0.5000	0.5936	+0.0001	+46	− 8
ξ^1 Sagittarii	5½	0.77	5.6	20 48.0	22 57.2	+ 6 42.6	−0.2049	0.5921	0.0041	+ 4	−49
ξ^2 Sagittarii	3½	0.77	5.8	21 15.0	23 5.9	+ 6 50.9	+0.2540	0.5921	0.0042	+30	−22
o Sagittarii	3½	0.74	6.0	21 54.2	30 1 52.6	+ 9 31.2	+0.9404	0.5919	0.0105	+68	+19
π Sagittarii	3	+0.70	+5.9	−21 11.9	3 56.6	+11 30.4	+0.2487	0.5911	+0.0151	+30	−23
50 Sagittarii	6	0.61	6.3	21 59.7	10 39.1	− 6 2.5	+1.2180	0.5871	0.0303	+68	+49
f Sagittarii	5	0.49	5.8	20 1.7	18 57.4	+ 1 57.0	−0.4750	0.5828	0.0479	− 6	−69
57 Sagittarii	6	+0.46	+5.5	−19 19.6	21 23.7	+ 4 17.8	−1.0790	0.5813	+0.0535	−45	−90

MAY.

σ Capricorni	5½	+0.31	+5.6	−19 27.9	1 8 53.1	− 8 38.1	−0.1928	0.5736	+0.0763	+11	−48
π Capricorni	5	0.27	5.3	18 34.6	12 18.5	− 5 20.2	−0.8470	0.5716	0.0825	−25	−90
ρ Capricorni	5½	0.27	5.2	18 10.8	12 58.9	− 4 41.3	−1.2070	0.5715	0.0839	−55	−90
o Capricorni	6	+0.25	+5.4	−18 57.0	13 25.0	− 4 16.1	−0.3676	0.5710	+0.0849	+ 3	−60
v Capricorni	5½	0.20	5.2	18 31.9	17 50.5	0 0.0	−0.4126	0.5685	0.0928	+ 1	−63
19 Capricorni	6	0.11	4.9	18 20.7	2 0 20.7	+ 6 16.4	+0.0298	0.5637	0.1039	+26	−35
21 Capricorni	6½	0.07	4.8	17 57.8	3 3.2	+ 8 53.3	−0.0826	0.5618	0.1086	+21	−42
θ Capricorni	4	+0.04	4.6	17 40.5	5 18.9	+11 4.2	−0.1373	0.5605	0.1122	+18	−45
31 Capricorni	6½	−0.03	+4.6	−17 55.8	10 54.3	− 7 31.7	+0.7843	0.5564	+0.1211	+72	+ 8
ι Capricorni	4½	0.06	4.3	17 18.6	12 44.1	− 5 45.7	+0.3522	0.5556	0.1238	+48	−17
γ Capricorni	3½	0.17	3.9	17 9.9	20 58.8	+ 2 12.5	+1.2710	0.5498	0.1352	+73	+52
44 Capricorni	6	0.17	3.1	14 54.6	22 25.0	+ 3 35.8	−0.9393	0.5494	0.1374	−25	−90
45 Capricorni	6½	0.18	3.2	15 15.6	22 51.3	+ 4 1.3	−0.5071	0.5490	0.1377	+ 1	−71
δ Capricorni	2½	−0.20	+3.6	−16 38.0	3 0 14.6	+ 5 21.8	+1.1520	0.5482	+0.1393	+73	+36
μ Capricorni	5	0.23	2.6	14 4.7	3 13.5	+ 8 14.9	−1.1570	0.5459	0.1431	−42	−90
ι Aquarii	4½	0.28	2.4	14 24.8	9 30.6	− 9 40.1	+0.1252	0.5420	0.1509	+37	−30
39 Aquarii	6½	0.32	2.3	14 44.7	12 24.1	− 6 52.2	+0.9230	0.5401	0.1543	+75	+16
42 Aquarii	5½	0.32	1.9	13 23.3	14 32.3	− 4 48.0	−0.2064	0.5394	0.1563	+20	−49
45 Aquarii	6½	−0.34	+2.0	−13 51.9	15 36.3	− 3 46.0	+0.4756	0.5382	+0.1574	+60	−11
50 Aquarii	6	0.37	1.9	14 5.9	18 15.8	− 1 11.6	+1.1520	0.5370	0.1602	+76	+35
B. A. C. 7835	6½	0.40	1.6	13 29.4	21 0.2	+ 1 27.7	+0.9387	0.5348	0.1629	+77	+17
58 Aquarii	6½	0.39	0.9	11 28.7	21 50.9	+ 2 16.8	−1.0970	0.5348	0.1640	−33	−90
70 Aquarii	6	0.47	0.4	11 8.8	4 6 13.8	+10 24.3	−0.0524	0.5307	0.1712	+30	−40
Lalande 44734	6½	−0.49	+0.1	−10 39.3	8 21.2	−11 32.2	−0.2188	0.5293	+0.1729	+22	−50
ψ^1 Aquarii	4	0.59	−0.7	9 41.8	20 8.9	− 0 5.7	+0.8310	0.5242	0.1815	+80	+10
χ Aquarii	5½	0.59	1.1	8 20.2	20 40.4	+ 0 24.8	−0.5582	0.5238	0.1819	+ 4	−74
ψ^2 Aquarii	4	0.61	0.7	9 47.7	21 12.5	+ 0 55.9	+1.1290	0.5237	0.1820	+80	+31
B. A. C. 8274	7	0.73	2.4	7 0.1	5 13 12.0	− 7 32.7	+1.0620	0.5182	0.1901	+83	+25
27 Piscium	5	−0.75	−3.4	− 4 10.7	18 33.9	− 2 20.0	−1.0120	0.5168	+0.1923	−22	−90
29 Piscium	5	0.76	3.7	3 39.1	20 13.9	− 0 42.9	−1.2680	0.5164	0.1928	−46	−90
4 Ceti	6	0.78	4.0	3 10.4	23 22.4	+ 2 20.2	−1.1900	0.5163	0.1938	−37	−90
5 Ceti	6	0.78	4.0	3 4.4	23 37.5	+ 2 34.9	−1.2530	0.5160	0.1940	−43	−90
14 Ceti	6	0.87	5.3	1 7.4	6 14 15.8	− 7 11.7	−0.5434	0.5132	0.1968	+ 8	−72
15 Ceti	6½	−0.87	−5.1	− 1 7.4	15 38.2	− 5 51.6	−0.2726	0.5128	+0.1968	+22	−53
26 Ceti	6	0.94	6.2	+ 0 45.9	7 5 31.2	+ 7 37.9	+0.3697	0.5125	0.1969	+59	−17
29 Ceti	6½	0.94	6.4	1 24.4	7 46.3	+ 9 49.2	+0.1016	0.5124	0.1965	+42	−31
33 Ceti	6	0.95	6.5	1 50.9	9 10.1	+11 10.7	−0.1128	0.5123	0.1963	+31	−43
35 Ceti	6½	0.95	6.6	1 52.7	10 14.0	−11 47.2	+0.0647	0.5122	0.1961	+41	−33
f Piscium	5	−0.97	−6.9	+ 3 1.4	13 4.7	− 9 1.3	−0.6489	0.5121	+0.1956	+ 2	−82
ν Piscium	4½	−1.02	−7.4	+ 4 55.1	8 1 49.8	+ 3 22.3	−0.2778	0.5132	+0.1924	+22	−52

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MAY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1888.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	″	° ′	d h m	h m				°	°
64 Ceti	5½	−1.08	−8.2	+ 8 2.6	8 17 52.4	− 5 2.2	−0.7199	0.5159	+0.1856	− 3	−82
ξ^1 Ceti	4½	1.08	8.2	8 19.2	18 44.4	− 4 11.8	−0.8676	0.5159	0.1850	−12	−82
				NEW	*MOON.*						
δ^1 Tauri	4	1.14	8.1	17 16.7	11 13 29.3	−11 25.4	−0.3069	0.5367	0.1210	+20	−45
δ^2 Tauri	5½	−1.14	−8.1	+17 10.9	14 3.8	−10 51.9	−0.1312	0.5373	+0.1204	+30	−34
δ^3 Tauri	5	1.14	8.1	17 40.1	14 44.4	−10 12.5	−0.5897	0.5374	0.1194	+ 4	−64
B. A. C. 1468	6½	1.12	7.8	18 31.7	12 0 53.2	− 0 22.8	−0.4041	0.5412	0.1048	+14	−49
i Tauri	5½	1.12	7.7	18 38.8	3 21.0	+ 2 0.3	−0.2800	0.5412	0.1013	+21	−41
m Tauri	5½	1.10	7.3	18 29.5	11 3.7	+ 9 28.3	+0.6262	0.5450	0.0891	+84	+10
ζ Tauri	3½	−1.04	−6.5	+21 4.3	13 1 21.8	− 0 41.4	−1.1130	0.5492	+0.0654	−35	−69
χ^1 Orionis	4½	1.00	6.4	20 15.1	9 13.8	+ 6 55.1	+0.2400	0.5516	0.0516	+52	− 7
χ^2 Orionis	6	1.00	6.5	19 43.4	9 29.6	+ 7 10.4	+0.8408	0.5518	0.0507	+90	+28
χ^3 Orionis	6	0.97	6.2	19 41.4	13 27.1	+11 0.0	+1.0620	0.5525	0.0433	+90	+44
χ^4 Orionis	5	0.98	6.1	20 8.3	13 39.4	+11 11.9	+0.5795	0.5525	0.0431	+79	+12
68 Orionis	6	−0.95	−5.9	+19 48.8	17 25.3	− 9 9.9	+1.0860	0.5535	+0.0363	+90	+46
15 Geminorum	6½	0.92	5.4	20 51.4	14 0 39.8	− 2 9.7	+0 1603	0.5552	0.0230	+47	− 8
16 Geminorum	6½	0.92	5.4	20 33.7	0 44.9	− 2 4.8	+0.4845	0.5552	0.0230	+70	+10
ν Geminorum	4½	0.91	5.4	20 16.8	1 13.2	− 1 37.4	+0.8033	0.5555	0.0222	+90	+28
d Geminorum	6	0.83	4.7	21 53.5	11 31.3	+ 8 19.9	−0.8312	0.5573	+0.0024	−12	−68
ζ Geminor. *mult.*	4	−0.78	−4.5	+20 43.9	17 16.0	−10 7.2	+0.4130	0.5581	−0.0083	+64	+ 7
56 Geminorum	5½	0.71	4.3	20 39.2	15 1 21.8	− 2 17.9	+0.3628	0.5588	0.0243	+60	+ 2
61 Geminorum	6	0.69	4.2	20 28.7	3 37.4	− 0 6.9	+0.4918	0.5588	0.0288	+71	+ 9
63 Geminorum	5½	0.69	3.9	21 40.2	3 57.8	+ 0 12.8	−0.8070	0.5588	0.0292	−11	−68
79 Geminorum	6½	0.61	3.8	20 35.0	11 51.1	+ 7 49.9	+0.0755	0.5599	0.0445	+42	−15
85 Geminorum	6	−0.56	−3.7	+20 10.6	16 36.2	−11 34.8	+0.2796	0.5599	−0.0537	+54	− 4
Saturn				20 26.0	16 4 28.5	− 0 7.0	−0.7614	0.5514	0.0391	− 8	−70
d^1 Cancri	6	0.43	3.5	18 41.4	5 7.1	+ 0 30.3	+1.0500	0.5599	0.0776	+90	+40
θ Cancri	5½	0.38	3.4	18 28.2	8 49.8	+ 4 5.4	+0.9840	0.5599	0 0843	+90	+34
35 Cancri	6½	0.37	2.9	19 58.5	10 28.8	+ 5 41.0	−0.7651	0.5604	0.0879	− 7	−70
ε Cancri	6½	−0.24	−2.7	+19 56.6	12 47.7	+ 7 55.1	−0.9378	0.5602	−0.0915	−19	−70
δ Cancri	4	0.31	3.1	18 33.8	14 43.5	+ 9 47.0	+0.3546	0.5597	0.0951	+59	− 5
80 Cancri	6½	0.16	2.8	18 30.2	17 3 1.6	− 2 20.3	−0.8853	0.5594	0.1166	−14	−71
83 Cancri	5½	0.13	2.6	18 10.8	6 12.9	+ 0 44.5	−0.9226	0.5594	0.1218	−17	−72
8 Leonis	5½	−0.03	2.8	16 56.3	14 23 6	+ 8 38.4	−0.6602	0.5589	0.1356	0	−70
34 Leonis	6½	+0.18	−3.1	+13 54.4	18 6 5.9	− 0 11.5	+0.1996	0.5581	−0.1589	+49	−20
37 Leonis	5½	0.20	2.9	14 17.2	8 23.2	+ 2 1.1	−0.5650	0.5578	0.1624	+ 6	−66
l Leonis	5½	0.40	3.4	11 8.2	23 12.2	− 7 40.2	+0.1529	0.5580	0.1809	+46	−25
B. A. C. 3837	6½	0.54	3.8	8 40.3	19 10 26.9	+ 3 11.6	+0.5785	0.5582	0.1932	+76	− 3
ν Virginis	4	0.72	3.7	7 9.3	20 0 51.1	− 6 53.7	−0.7531	0.5602	0.2058	− 4	−79
b Virginis	5½	+0.78	−3.8	+ 4 16.6	7 12.0	− 0 45.9	+0.9812	0.5603	−0.2098	+90	+10
c Virginis	5½	0.89	4.1	3 56.1	16 21.2	+ 8 4.3	−0.7570	0.5619	0.2146	− 4	−80
B. A. C. 4254	6	0.99	4.0	+ 2 28.2	21 0 21.8	− 8 11.8	−1.0160	0.5636	0.2177	−21	−88
80 Virginis	6	1.28	4.3	− 4 49.6	22 1 18.5	− 8 8.0	+0.7903	0.5737	0.2175	+85	+ 6
88 Virginis	6½	1.34	3.9	6 16.8	6 46.5	− 2 51.8	+1.0400	0.5747	0.2153	+84	+23
ξ^1 Libræ	6	+1.58	−2.8	−11 26.5	23 10 18.9	− 0 20.7	+0.4395	0.5881	−0.1935	+60	−13
ξ^2 Libræ	5½	1.58	2.7	10 57.5	11 17.5	+ 0 35.6	−0.2239	0.5887	0.1923	+21	−50
17 Libræ	7	1.58	2.6	10 42.2	11 54.3	+ 1 11.0	−0.5916	0.5892	0.1915	+ 1	−77
18 Libræ	6½	1.58	2.6	10 41.7	12 10.0	+ 1 26.2	−0.6503	0.5892	0.1914	− 2	−84
γ Libræ	4½	1.69	1.3	14 24.9	24 2 50.4	− 8 27.5	+0.3333	0.5969	0.1709	+50	−19
η Libræ	6	+1.72	−1.0	−15 18.9	6 13.3	− 5 12.6	+0.6454	0.5985	−0.1657	+71	− 1
θ Libræ	4½	1.75	0.7	16 24.0	10 2.6	− 1 32.2	+1.0900	0.6002	0.1590	+74	+30
49 Libræ	6	1.75	−0.4	16 12.2	12 38 3	+ 0 57.3	+0.4918	0.6011	0 1539	+59	−10
χ Ophiuchi	4½	1.77	+0.8	18 12.1	22 58.3	+10 52.5	+0.9623	0.6047	0.1342	+72	+20
ϕ Ophiuchi	4½	1.75	0 9	16 22.1	25 0 35.7	−11 34.1	−1.0540	0.6050	0.1308	−36	−90
24 Scorpii	5½	+1.77	+1.3	−17 31.5	4 36.0	− 7 43.5	−0.4246	0.6066	−0.1221	+ 3	−64
29 Ophiuchi	6½	+1.77	+2.3	−18 43.2	12 21.9	− 0 16.5	−0.1362	0.6080	−0.1058	+16	−45

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MAY.

The Star's Name.	Mag.	Red'ns from 1888.0. Δα	Δδ	Apparent Declination.	At Conjunction in R. A. Washington Mean Time.	Hour Angle H	Y	x′	y′	Limiting Parallels. N.	S.
		s	″	° ′	d h m	h m				°	°
B. A. C. 6098	6	+1.70	+4.9	−20 44.0	26 11 30.9	− 2 4.3	+0.0513	0.6082	−0.0495	+22	−34
μ Sagittarii	4	1.68	5.4	21 5.2	15 45.9	+ 2 0.2	+0.2106	0.6074	0.0393	+30	−25
14 Sagittarii	6	1.68	5.5	21 44.4	15 56.8	+ 2 10.7	+0.8541	0.6074	0.0389	+68	+13
15 Sagittarii	5½	1.67	5.4	20 45.5	16 19.4	+ 2 32.4	−0.1360	0.6071	0.0381	+11	−45
16 Sagittarii	6½	1.67	5.4	20 25.1	16 20.2	+ 2 33.1	−0.4758	0.6071	0.0380	− 8	−69
21 Sagittarii	5	+1.63	+5.8	−20 35.9	20 13.1	+ 6 16.5	−0.4259	0.6071	−0.0283	− 6	−65
B. A. C. 6336	6	1.61	6.4	21 29.3	27 1 1.8	+10 53.5	+0.3573	0.6064	0.0163	+37	−17
B. A. C. 6347	6	1.60	6.4	21 8.4	1 25.3	+11 16.1	+0.0017	0.6057	0.0152	+16	−37
29 Sagittarii	5½	1.57	6.6	20 27.0	5 35.7	− 8 43.7	−0.7323	0.6038	0.0053	−25	−90
30 Sagittarii	6½	1.57	6.9	22 17.3	6 1.0	− 8 19.4	+1.1100	0.6038	0.0040	+68	+34
31 Sagittarii	6½	+1.57	+6.9	−22 3.0	6 31.2	− 7 50.4	+0.8710	0.6038	−0.0027	+68	+15
33 Sagittarii	6	1.56	6.9	21 29.7	7 15.5	− 7 7.9	+0.3116	0.6036	−0.0010	+33	−19
ξ¹ Sagittarii	5½	1.54	6.9	20 48.0	8 34.1	− 5 52.5	−0.3852	0.6025	+0.0023	− 6	−62
ξ² Sagittarii	3½	1.54	6.9	21 15.0	8 42.7	− 5 44.2	+0.0671	0 6025	0.0027	+19	−33
o Sagittarii	3½	1.52	7.3	21 54.2	11 24.3	− 3 9.1	+0.7399	0.6012	0.0092	+68	+ 6
π Sagittarii	3	+1.50	+7.3	−21 11.9	13 24.7	− 1 13.5	+0.0538	0.6008	+0.0143	+19	−34
50 Sagittarii	6	1.43	8.0	21 59.7	19 54.6	+ 5 1.0	+1.0030	0.5980	0.0294	+68	+25
f Sagittarii	5	1.33	7.9	20 1.7	28 3 57.1	−11 15.4	−0.6792	0.5919	0.0479	−18	−90
σ Capricorni	5½	1.16	8.5	19 27.9	17 26.0	+ 1 42.6	−0.4195	0.5835	0.0768	− 1	−64
π Capricorni	5	1.12	8.4	18 34.6	20 44.7	+ 4 53.9	−1.0700	0.5813	0.0830	−41	−90
o Capricorni	6	+1.10	+8.5	−18 57.0	21 48.7	+ 5 55.5	−0.5797	0.5811	+0.0853	−10	−80
υ Capricorni	5½	1.05	8.4	18 31.9	29 2 6.2	+10 3.4	−0.6454	0.5769	0.0938	−12	−86
19 Capricorni	6	0.98	8.5	18 20.7	8 24.2	− 7 52.3	−0.2146	0.5725	0.1053	+13	−50
20 Capricorni	6½	0.94	8.9	19 28.0	10 27.5	− 5 53.4	+1.1690	0.5725	0.1090	+70	+39
21 Capricorni	6½	0.94	8.5	17 57.8	11 1.7	− 5 20.5	−0.3275	0.5705	0.1098	+ 8	−57
θ Capricorni	4	+0.91	+8.4	−17 40.5	13 14.2	− 3 12.7	−0.3819	0.5694	+0.1134	+ 5	−61
30 Capricorni	5½	0.85	8.5	18 27.1	18 30.2	+ 1 52 2	+1.0470	0.5644	0.1224	+72	+27
31 Capricorni	6½	0.85	8.4	17 55.8	18 38.8	+ 2 0.5	+0.5208	0.5644	0.1224	+58	− 8
ι Capricorni	4½	0.82	8.2	17 18.6	20 25.2	+ 3 43.1	+0.0925	0.5633	0.1253	+32	−31
γ Capricorni	3½	0.72	8.2	17 9.9	30 4 26.1	+11 27.5	+0.9947	0.5573	0.1372	+73	+22
44 Capricorni	6	+0.71	+7.4	−14 54.6	5 50.0	−11 11.5	−1.1900	0.5571	+0.1390	−46	−90
45 Capricorni	6½	0.70	7.5	15 15.6	6 15.5	−10 46.8	−0.7608	0.5568	0.1393	−13	−90
δ Capricorni	2½	0 68	7.4	16 38.0	7 36.6	− 9 28.5	+0.8786	0.5547	0.1414	+74	+14
ι Aquarii	4½	0.58	7.1	14 24.7	16 38.5	− 0 44.6	−0.1414	0.5483	0.1525	+23	−45
39 Aquarii	6½	0.54	7.1	14 44.6	19 27.7	+ 1 59.0	+0.6460	0.5457	0.1560	+72	− 1
42 Aquarii	5½	+0.53	+6.8	−13 23.2	21 33.0	+ 4 0.3	−0.4326	0.5450	+0.1582	+ 8	−64
45 Aquarii	6½	0.51	6.9	13 51.8	22 35.6	+ 5 0.9	+0.2057	0.5434	0.1594	+43	−26
50 Aquarii	6	0.47	6.9	14 5.8	31 1 11.5	+ 7 31.7	+0.8722	0.5419	0.1620	+76	+13
B. A. C. 7835	6½	0.44	6.6	13 29.3	3 52.3	+10 7.4	+0.6619	0.5401	0.1648	+74	− 1
70 Aquarii	6	0.35	5.5	11 8.7	12 55.0	− 5 7.0	−0.3166	0.5344	0.1730	+16	−56
Lalande 44734	6½	+0.33	+5.2	−10 39.2	15 0.0	− 3 5.8	−0.4839	0.5332	+0.1749	+ 7	−68
74 Aquarii	6	+0.32	+5.7	−12 12.7	15 22.0	− 2 44.6	+1.2560	0.5332	+0.1751	+78	+45

JUNE.

ψ¹ Aquarii	4	+0.21	+4.4	− 9 41.7	1 2 36.3	+ 8 9.2	+0.5639	0.5266	+0.1831	+70	− 6
χ Aquarii	5½	0.21	3.9	8 20.1	3 7.3	+ 8 39.2	−0.8108	0.5261	0.1832	−10	−90
ψ² Aquarii	4	0.20	4.4	9 47.6	3 39.0	+ 9 9.9	+0.8594	0.5258	0.1837	+80	+11
B. A. C. 8274	7	0.04	2.8	7 0.1	19 27.2	+ 0 30.1	+0.8091	0.5199	0.1921	+83	+ 8
27 Piscium	5	+0.01	+1.6	4 10.6	2 0 46.0	+ 5 39.6	−1.2510	0.5181	0.1938	−43	−90
14 Ceti	6	−0.15	−0.3	− 1 7.3	20 21.3	+ 0 41.2	−0.7652	0.5131	+0.1981	− 5	−90
15 Ceti	6½	0.18	0.3	− 1 7.3	21 43.4	+ 2 1.1	−0.4937	0.5124	0.1981	+10	−68
26 Ceti	6	0.28	1.6	+ 0 46.0	3 11 34.7	− 8 31.2	+0.1676	0.5110	0.1978	+47	−28
29 Ceti	6½	0.30	1.8	1 24.5	13 49.9	− 6 19.7	-0.0995	0.5105	0.1974	+31	−42
33 Ceti	6	0.31	2.0	1 51.0	15 13.7	− 4 58.3	−0 3094	0.5104	0.1972	+20	−55
35 Ceti	6½	−0.32	−2.1	+ 1 52.8	16 17.6	− 3 56.4	−0.1326	0.5104	+0.1971	+30	−44
f Piscium	5	−0.33	−2.4	+ 3 1.5	19 8.3	− 1 10.2	−0.8414	0.5109	+0.1969	−10	−87

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JUNE.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1888.0. $\Delta\alpha$	$\Delta\delta$	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		s	″	° ′	d h m	h m				°	°
ν Piscium	4½	−0.43	−3.5	+ 4 55.1	4 7 54.2	+11 14.2	−0.4466	0.5116	+0.1934	+13	−64
64 Ceti	5½	0.52	4.9	8 2.6	23 58.7	+ 2 51.5	−0.8574	0.5135	0.1866	−11	−82
ξ^1 Ceti	4½	0.53	5.0	8 19.2	5 0 51.0	+ 3 42.2	−1.0040	0.5135	0.1866	−21	−82
ξ^2 Ceti	4½	0.58	5.1	7 57.4	8 56.3	+11 33.8	+0.8872	0.5157	0.1816	+90	+15
B. A. C. 830	6	0.63	5.7	10 15.7	16 30.0	− 5 5.6	−0.3222	0.5176	0.1762	+19	−53
μ Ceti	4½	−0.64	−5 6	+ 9 38.3	17 47.1	− 3 50.7	+0.5983	0.5180	+0.1754	+78	− 2
Lalande 5725	6	0.69	6.5	12 45.4	6 4 59.2	+ 7 1.9	−0.9519	0.5217	0.1665	−18	−77
f Tauri	4	0.77	6.3	12 33.0	17 36.9	− 4 42.7	+1.3030	0.5260	0.1542	+90	+60
B. A. C. 1272	6	0.84	7.0	17 2.3	7 12 14.7	−10 38.8	−0.9908	0.53 9	0.1328	−22	−73
δ^1 Tauri	4	0.88	7.0	17 16.7	19 37.3	− 3 29.9	−0.3118	0.5374	0.1233	+20	−45
				NEW	*MOON.*						
ν Geminorum	4½	−0.90	−5.2	+20 16.8	10 6 59.0	+ 5 55.8	+0.9001	0.5584	+0.0238	+90	+34
d Geminorum	6	0.89	4.6	21 53.5	17 12.1	− 8 12.0	−0.7119	0.5602	+0.0040	− 4	−66
ζ Geminor. *mult.*	4	0.86	4.5	20 43.9	22 54.0	− 2 41.8	+0.5370	0.5610	−0.0072	+75	+14
δ Geminorum	3½	−0.83	−3.9	+22 11.2	11 6 5.0	+ 4 14.5	−1.1410	0.5619	−0.0216	−38	−68
56 Geminorum	5½	0.82	4.1	20 39.2	6 56.3	+ 5 3.9	+0.4999	0.5623	0.0231	+71	+10
61 Geminorum	6	0.81	4.0	20 28.7	9 11.0	+ 7 14.0	+0.6324	0.5623	0.0276	+85	+17
63 Geminorum	5½	0.81	3.8	21 40.2	9 31.3	+ 7 33.6	−0.6648	0.5623	0.0283	− 1	−61
79 Geminorum	6½	0.75	3.5	20 35.0	17 21.7	− 8 52.2	+0.2266	0.5627	0.0431	+51	− 6
85 Geminorum	6	−0.72	−3.4	+20 10.6	22 5.3	− 4 18.3	+0.4363	0.5627	−0.0528	+66	+ 4
d^1 Cancri	6	0 62	3.0	18 41.5	12 10 33.3	+ 7 43.8	+1.2290	0.5618	0.0769	+90	+56
θ Cancri	5½	0.59	2.8	18 28.3	14 15.6	+11 18.5	+1.1570	0.5615	0.0832	+90	+48
Saturn				19 51.4	14 40.5	+11 42.6	−0.3601	0.5500	0.0389	+15	−40
35 Cancri	6½	0.59	2.4	19 58.5	15 54.5	−11 6.0	−0.5919	0.5615	0.0864	+ 4	−60
39 Cancri	6½	−0.58	−2.1	+20 24.2	18 3.5	− 9 1.4	−1.2370	0.5610	−0.0902	−49	−70
40 Cancri	6½	0.58	2.1	20 22.0	18 5.7	− 8 59.3	−1.2010	0.5610	0.0904	−44	−70
ε Cancri	6½	0.58	2.2	19 56.6	18 13.1	− 8 52.1	−0.7598	0.5610	0.0904	− 7	−70
δ Cancri	4	0.56	2.4	18 33.9	20 9.0	− 7 0.2	+0.5338	0.5610	0.0943	+74	+ 5
80 Cancri	6½	0.44	1.8	18 30.2	13 8 28.3	+ 4 53.7	−0.6955	0.5591	0.1161	− 3	−71
83 Cancri	5½	−0.40	−1.7	+18 10.8	11 40.2	+ 7 59.2	−0.7297	0.5584	−0.1212	− 4	−72
8 Leonis	5½	0.31	1.6	16 56.3	19 53.6	− 8 4.3	−0.4648	0.5573	0.1344	+11	−56
34 Leonis	6½	0.12	1.7	13 54.5	14 11 45.0	+ 7 15.1	+0.4077	0.5573	0.1585	+63	− 9
37 Leonis	5½	−0.10	1.4	14 17.2	14 4.0	+ 9 29.3	−0.3600	0.5547	0.1609	+17	−52
l Leonis	5½	+0.09	1.7	11 8.3	15 5 7.0	+ 0 2.1	+0.3680	0.5530	0.1794	+60	−14
B. A. C. 3837	6½	+0.23	−1.9	+ 8 40.4	16 35.8	+11 8.0	+0.7930	0.5513	−0.1910	+90	+10
ν Virginis	4	0.43	1.8	7 9.4	16 7 21.6	+ 1 24.3	−0.5547	0.5516	0.2030	+ 7	−71
b Virginis	5½	0.52	2.4	4 16.7	13 53.1	+ 7 42.7	+1.0590	0.5518	0.2072	+90	+25
c Virginis	5½	0.64	2.1	3 56.2	23 19.0	− 7 10.3	−0.5714	0.5533	0.2118	+ 6	−74
B. A. C. 4254	6	0.74	2.1	+ 2 28.3	17 7 35.0	+ 0 49.1	−0.8406	0.5551	0.2150	− 9	−88
80 Virginis	6	+1.10	−3.0	− 4 49.5	18 9 23.3	+ 1 44.6	+0.9629	0.5624	−0.2146	+85	+17
88 Virginis	6½	1.18	3.0	6 16.7	15 3.0	+ 7 12.2	+1.2090	0.5652	0.2128	+84	+38
ξ^1 Libræ	6	1.56	2.1	11 26.5	19 19 30.8	+10 39.1	+0.5513	0.5786	0.1916	+68	− 7
ξ^2 Libræ	5½	1.57	1.9	10 57.5	20 31.2	+11 57.3	−0.1226	0.5791	0.1907	+26	−44
17 Libræ	7	1.57	1.7	10 42.2	21 9.1	−11 46.2	−0.4950	0.5794	0.1901	+ 7	−69
18 Libræ	6½	+1.57	−1.7	−10 41.7	21 25.3	−11 30.6	−0.5546	0.5798	−0.1898	+ 3	−74
B. A. C. 5070	6	1.68	1.0	11 58.1	20 7 46.7	− 1 32.4	−1.1910	0.5855	0.1770	−42	−90
γ Libræ	4½	1.74	1.0	14 24.9	12 30.7	+ 3 0.8	+0.4131	0.5887	0.1700	+55	−14
η Libræ	6	1.79	0.7	15 18.9	15 58.7	+ 6 20.9	+0.7209	0.5898	0.1648	+74	+ 3
θ Libræ	4½	1.83	0.6	16 24.0	19 53.6	+10 6.8	+1.1630	0.5925	0.1586	+74	+36
49 Libræ	6	+1 86	−0.1	−16 12.2	22 32.8	−11 20.1	+0.5543	0.5940	−0.1542	+63	− 6
χ Ophiuchi	4½	1.97	+0.9	18 12.1	21 9 5.2	− 1 12.5	+1.0080	0.5991	0.1348	+72	+23
ϕ Ophiuchi	4½	1.96	1.4	16 22.1	10 44.5	+ 0 22.9	−1.0280	0.5995	0.1317	−33	−90
24 Scorpii	5½	2.00	1.6	17 31.5	14 48.6	+ 4 17.2	−0.4025	0.6015	0.1232	+ 4	−63
29 Ophiuchi	6½	2.05	2.5	18 43.2	22 40.7	+11 50.4	−0.1238	0.6038	0.1063	+17	−44
B. A. C. 6098	6	+2.13	+5.3	−20 44.0	22 21 58.5	+10 11.4	+0.0199	0.6087	−0.0518	+20	−36
μ Sagittarii	4	+2.13	+5.8	−21 5.2	23 2 13.5	− 9 44.1	+0.1761	0.6089	−0.0411	+28	−27

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JUNE.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1888.0. Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		s	″	° ′	d h m	h m				°	°
14 Sagittarii	6	+2.14	+ 5.9	−21 44.4	23 2 24.3	− 9 33.6	+0 8191	0.6089	−0.0405	+68	+11
15 Sagittarii	5½	2.13	5.9	20 45.5	2 47.2	− 9 11.7	−0.1744	0.6089	0.0396	+ 9	−48
16 Sagittarii	6½	2.12	5.9	20 25.1	2 47.7	− 9 11.3	−0.5148	0 6089	0.0396	−10	−73
21 Sagittarii	5	2.13	6.4	20 36.1	6 40.0	− 5 28.4	−0.4659	0.6091	0.0299	− 8	−69
B. A. C. 6336	6	2.13	7.0	21 29.3	11 27.6	− 0 52.5	+0.3050	0.6082	0.0179	+34	−20
B. A. C. 6347	6	+2.12	+ 7.0	−21 8.4	11 50.8	− 0 30.3	−0.0500	0.6080	−0.0170	+13	−41
29 Sagittarii	5½	2.11	7.5	20 27.0	15 59.7	+ 3 28.5	−0.7896	0 6071	0.0067	−28	−90
30 Sagittarii	6½	2.13	7.7	22 17.3	16 24.8	+ 3 52.6	+1.0500	0.6070	0.0053	+68	+29
31 Sagittarii	6½	2.12	7.7	22 3.0	16 54.8	+ 4 21.3	+0.8079	0.6067	0.0043	+68	+10
33 Sagittarii	6	2.11	7.8	21 29.7	17 38.5	+ 5 3.3	+0.2487	0.6067	−0.0025	+29	−23
ξ^1 Sagittarii	5½	+2.10	+ 7.9	−20 48.0	18 56.6	+ 6 18.2	−0.4481	0.6067	+0.0008	− 9	−67
ξ^2 Sagittarii	3½	2.11	7.9	21 15.0	19 5.1	+ 6 26.3	+0.0033	0.6066	0.0012	+15	−37
o Sagittarii	3½	2.10	8.3	21 54.2	21 45.3	+ 9 0.0	+0.6716	0.6060	0.0077	+62	+ 2
π Sagittarii	3	2.08	8.4	21 11.9	23 44.3	+10 54.3	−0.0184	0.6052	0.0124	+15	−38
50 Sagittarii	6	2.06	9.2	21 59.6	24 6 9.8	− 6 55.7	+0.9158	0.6026	0.0279	+68	+18
f Sagittarii	5	+2.00	+ 9.7	−20 1.6	14 5.3	+ 0 40.9	−0.7723	0.5984	+0.0469	−24	−90
σ Capricorni	5½	1.89	10.7	19 27.8	25 3 19.7	−10 35.6	−0.5305	0.5912	0.0761	− 7	−74
π Capricorni	5	1.86	10.7	18 34.5	6 34.4	− 7 28.4	−1.1790	0.5889	0.0817	−52	−90
o Capricorni	6	1.86	10.9	18 56.9	7 37.5	− 6 27.7	−0.7086	0.5876	0.0854	−16	−90
ν Capricorni	5½	1.81	11.0	18 31.8	11 49.0	− 2 25.7	−0.7656	0.5843	0.0938	−19	−90
19 Capricorni	6	+1.76	+11.4	−18 20.6	17 58.7	+ 3 30.2	−0.3431	0.5809	+0.1057	+ 6	−58
20 Capricorni	6½	1.73	11.7	19 27.9	19 59.1	+ 5 26.2	+1.0280	0.5793	0.1095	+71	+25
21 Capricorni	6½	1.73	11.5	17 57.7	20 32.4	+ 5 58.2	−0.4605	0.5785	0.1105	0	−67
θ Capricorni	4	1.70	11.5	17 40.4	22 41.9	+ 8 3.0	−0.5144	0.5765	0.1141	− 2	−72
30 Capricorni	5½	1.65	11.9	18 27.0	26 3 50.4	−10 59.7	+0.8982	0.5725	0.1229	+72	+15
31 Capricorni	6½	+1.65	+11.8	−17 55.7	3 58.7	−10 51.6	+0.3741	0.5723	+0.1233	+48	−16
ι Capricorni	4½	1.63	11.7	17 18.5	5 42.6	− 9 11.5	−0.0501	0.5715	0.1261	+24	−40
γ Capricorni	3½	1.54	11.8	17 9.8	13 31.7	− 1 39.0	+0.8333	0.5653	0.1384	+73	+11
45 Capricorni	6½	1.52	11.4	15 15.5	15 19.4	+ 0 5.0	−0.9026	0.5648	0.1409	−22	−90
δ Capricorni	2½	1.51	11.8	16 37.9	16 37.3	+ 1 20.1	+0.7148	0.5624	0.1427	+73	+ 3
ι Aquarii	4½	+1.41	+11.3	−14 24.6	27 1 25.5	+ 9 50.3	−0.2779	0.5555	+0.1544	+15	−54
39 Aquarii	6½	1.38	11.4	14 44.5	4 10.4	−11 30.4	+0.7549	0.5540	0.1576	+70	+ 5
42 Aquarii	5½	1.36	11.1	13 23.1	6 12.6	− 9 32.2	−0.6263	0.5526	0.1601	− 3	−82
45 Aquarii	6½	1.34	11.2	13 51.7	7 13.6	− 8 33.3	+0.0386	0.5514	0.1610	+33	−35
50 Aquarii	6	1.31	11.3	14 5.7	9 45.6	− 6 6.3	+0.6960	0.5496	0.1639	+76	+ 1
B. A. C. 7835	6½	+1.29	+11.1	−13 29.2	12 22.6	− 3 34.4	+0.4895	0.5480	+0.1663	+62	−10
70 Aquarii	6	1.20	10.4	11 8.6	21 12.0	+ 4 57.8	−0.4861	0.5414	0.1751	+ 7	−68
Lalande 44734	6½	1.18	10.2	10 39.1	23 14.0	+ 6 56.0	−0.6507	0.5404	0.1768	− 2	−84
74 Aquarii	6	1.17	10.6	12 12.6	23 35.6	+ 7 16.8	+1.0690	0.5400	0.1772	+78	+26
ψ^1 Aquarii	4	1.06	9.6	9 41.6	28 10 34.4	− 6 5.0	+0.3804	0.5334	0.1854	+57	−16
χ Aquarii	5½	+1.06	+ 9.1	− 8 20.0	11 4.7	− 5 35.6	−0.9822	0.5331	+0.1858	−22	−90
ψ^2 Aquarii	4	1.05	9.6	9 47.5	11 35.8	− 5 5.5	+0.6750	0.5325	0.1859	+78	0
ψ^3 Aquarii	4½	1.04	9 8	10 13.2	12 7.1	− 4 35.1	+1.2320	0.5319	0.1861	+80	+42
B. A. C. 8274	7	0.89	8.2	7 0.0	29 3 4.8	+ 9 55.3	+0.6216	0.5246	0.1938	+77	− 3
14 Ceti	6	0.67	5.3	1 7.2	30 3 35.5	+ 9 43.1	−0.9383	0.5157	0.1995	−16	−90
15 Ceti	6½	+0.65	+ 5.3	− 1 7.2	4 56.5	+11 1.8	−0.6685	0.5140	+0.1995	+ 1	−85
26 Ceti	6	0.53	3.9	+ 0 46.1	18 39.0	+ 0 20.7	−0.0055	0.5128	0.1991	+37	−37
29 Ceti	6½	0.51	3.6	1 24.6	20 52.9	+ 2 30.9	−0.2674	0.5122	0.1988	+22	−52
33 Ceti	6	0.50	3.4	1 51.1	22 15.9	+ 3 51.5	−0.4780	0.5118	0.1984	+11	−67
35 Ceti	6½	+0.49	+ 3.3	+ 1 52.9	23 19.3	+ 4 53.1	−0.3004	0.5117	+0.1982	+21	−55

JULY.

f Piscium	5	+0.48	+ 2.8	+ 3 1.5	1 2 8.8	+ 7 37.9	−1.0020	0.5119	+0.1978	−20	−87
ν Piscium	4½	0.36	+ 1.6	4 55.2	14 50.0	− 4 2.5	−0.6040	0.5122	0.1945	+ 3	−79
64 Ceti	5½	+0.23	− 0.2	+ 8 2.7	2 6 51.5	+11 31.9	−1.0020	0.5130	+0.1873	−21	−82
ξ^1 Ceti	4½	+0.23	− 0.3	+ 8 19.3	7 43.7	−11 37.5	−1.1440	0.5133	+0.1867	−32	−82

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JULY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1888.0.		Apparent Declination	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	″	° ′	d h m	h m				°	°
ξ^2 Ceti	4½	+0.15	−0.6	+ 7 57.5	2 15 48.4	− 3 46.5	+0.7467	0.5152	+0.1821	+90	+ 7
B. A. C. 830	6	0.09	1.5	10 15.8	23 22.0	+ 3 34.0	−0.4510	0.5166	0.1771	+12	−62
μ Ceti	4½	0.08	1.3	9 38.4	3 0 39.2	+ 4 49.0	+0.4677	0.5171	0.1760	+67	− 9
Lalande 5725	6	+0.01	2.7	12 45.5	11 51.8	− 8 17.8	−1.0670	0.5202	0.1669	−26	−77
f Tauri	4	−0.11	3.1	12 33.0	4 0 30.3	+ 3 58.2	+1.1990	0.5243	0.1549	+90	+43
B. A. C. 1272	6	−0.23	−4.5	+17 2.3	19 9.4	− 1 56.5	−1.0700	0.5327	+0.1339	−28	−73
δ^1 Tauri	4	0.29	4.7	17 16.7	5 2 32.2	+ 5 12.6	−0.3823	0.5357	0.1237	+16	−50
63 Tauri	6	0.29	4.5	16 30.7	2 47.3	+ 5 27.2	+0.4945	0.5357	0.1236	+70	− 1
δ^2 Tauri	5½	0.29	4.7	17 10.9	3 6.5	+ 5 45.9	−0.2059	0.5357	0.1234	+26	−39
δ^3 Tauri	5	0.30	4.8	17 40.1	3 46.9	+ 6 25.0	−0.6582	0.5362	0.1223	0	−69
75 Tauri	6½	−0.31	−4.5	+16 6.4	5 16.0	+ 7 51.4	+1.2430	0.5370	+0.1202	+90	+54
B. A. C. 1468	6½	0.37	5.0	18 31.7	13 52.9	− 7 48.0	−0.4423	0.5414	0.1079	+12	−52
i Tauri	5½	0.38	4.9	18 38.8	16 20.0	− 5 25.6	−0.3120	0.5424	0.1046	+20	−43
m Tauri	5½	0.42	5.0	18 29.5	23 59.3	+ 1 58.9	+0.6099	0.5465	0.0924	+82	+10
ζ Tauri	3½	0.51	5.3	21 4.3	6 14 8.9	− 8 19.3	−1.0760	0.5526	0.0686	−31	−69
χ^1 Orionis	4½	−0.55	−5.2	+20 15.1	21 55.0	− 0 48.8	+0.3000	0.5550	+0.0545	+56	− 4
				NEW	*MOON.*						
δ Cancri	4	0.55	2.2	18 33.9	10 2 6.4	+ 0 44.6	+0.0584	0.5657	−0.0942	+41	−21
Saturn				19 5.3	2 34.7	+ 1 11.9	−0.0177	0.5522	0.0913	+36	−24
80 Cancri	6½	−0.50	−1.5	+18 30.2	14 15.9	−11 31.3	−0.6295	0.5640	−0.1159	+ 2	−66
83 Cancri	5½	0.48	1.3	18 10.8	17 25.2	− 8 28 4	−0.6619	0.5632	0.1214	0	−69
8 Leonis	5½	0.43	1.1	16 56.3	11 1 32.7	− 0 37.8	−0.3930	0.5618	0.1349	+15	−52
34 Leonis	6½	0.31	0.8	13 54.5	17 14.3	− 9 28.3	+0.4870	0.5586	0.1581	+69	− 5
37 Leonis	5½	0.29	0.6	14 17.2	19 32.0	− 7 15.4	−0.2774	0.5585	0.1614	+22	−46
l Leonis	5½	−0.14	−0.6	+11 8.3	12 10 28.9	+ 7 11.3	+0.4549	0.5554	−0.1799	+66	− 9
B. A. C. 3837	6½	−0.01	0.6	8 40.4	21 55.7	− 5 44.8	+0.8896	0.5530	0.1910	+90	+16
v Virginis	4	+0.16	0.3	7 9.4	13 12 42.8	+ 8 32.8	−0.4605	0.5512	0.2028	+12	−64
b Virginis	5½	0.24	0.7	4 16.7	19 16.4	− 9 6.6	+1.1610	0.5512	0.2067	+90	+33
c Virginis	5½	0.35	0.3	3 56.2	14 4 46.8	+ 0 4.9	−0.4769	0.5507	0.2110	+12	−67
B. A. C. 4254	6	+0.46	−0.4	+ 2 28.3	13 8.5	+ 8 9.9	−0.7491	0.5517	−0.2137	− 4	−88
80 Virginis	6	0.82	1.3	− 4 49.5	15 15 24.3	+ 9 33.0	+1.0640	0.5562	0.2123	+85	+25
ξ^1 Libræ	6	1.32	1.0	11 26.5	17 2 26.3	− 4 37.8	+0.6336	0.5702	0.1894	+74	− 2
ξ^2 Ceti	5½	1.33	0.7	10 57.5	3 28.6	− 3 37.7	−0.0504	0.5702	0.1884	+30	−40
17 Libræ	7	1.35	0.7	10 42.2	4 7.7	− 3 0.0	−0.4295	0.5702	0.1876	+10	−64
18 Libræ	6½	+1.36	−0.6	−10 41.7	4 24.3	− 2 44.0	−0.4899	0.57. 2	−0.1871	+ 7	−69
B. A. C. 5070	6	1.50	+0.1	11 58.1	15 5.1	+ 7 33.7	−1.1410	0.5758	0.1746	−37	−90
γ Libræ	4½	1.58	−0.1	14 24.9	19 58.0	−11 44.2	+0.4823	0.5788	0.1681	+60	−11
η Libræ	6	1.63	−0.1	15 18.9	23 31.8	− 8 18.3	+0.7956	0.5809	0.1628	+75	+ 8
θ Libræ	4½	1.70	0.0	16 24.0	18 3 34.9	− 4 24.2	+1.2420	0.5830	0.1568	+74	+46
49 Libræ	6	+1.73	+0.4	−16 12.2	6 19.2	− 1 46.0	+0.6170	0.5834	−0.1523	+68	− 3
χ Ophiuchi	4½	1.88	1.0	18 12.1	17 11.4	+ 8 41.5	+1.0690	0.5891	0.1335	+72	+28
ϕ Ophiuchi	4½	1.88	1.6	16 22.1	18 53.6	+10 19.7	−0.9949	0.5897	0.1301	−31	−90
24 Scorpii	5½	1.94	1.9	17 31.5	23 5.2	− 9 38.4	−0.3628	0.5920	0.1223	+ 7	−60
29 Ophiuchi	6½	2.04	2.6	18 43.2	19 7 11.1	− 1 51.3	−0.0853	0.5956	0.1058	+20	−42
B. A. C. 6098	6	+2.26	+5.2	−20 44.0	20 7 4.4	− 2 54.7	+0.0419	0.6017	−0.0520	+22	−35
μ Sagittarii	4	2.29	5.7	21 5.2	11 24.9	+ 1 15.3	+0.1963	0.6027	0.0411	+29	−26
14 Sagittarii	6	2.30	5.7	21 44.4	11 35.8	+ 1 25.8	+0.8457	0.6027	0.0407	+68	+13
15 Sagittarii	5½	2.30	5.8	20 45.5	11 59.2	+ 1 48.3	−0.1578	0.6029	0.0399	+10	−46
16 Sagittarii	6½	2.29	5.9	20 25.1	11 59.8	+ 1 48.8	−0.5000	0.6029	0.0399	− 9	−71
21 Sagittarii	5	+2.31	+6.4	−20 35.9	15 56.6	+ 5 36.1	−0.4580	0.6029	−0.0303	− 7	−68
B. A. C. 6336	6	2.34	6.9	21 29.3	20 49.5	+10 17.3	+0.3193	0.6029	0.0185	+35	−19
B. A. C. 6347	6	2.34	7.0	21 8.4	21 13.1	+10 40.0	−0.0386	0.6029	0.0175	+14	−39
29 Sagittarii	5½	2.35	7.6	20 27.0	21 1 26.3	− 9 16.9	−0.7861	0.6029	0.0071	−28	−90
30 Sagittarii	6½	2.37	7.5	22 17.3	1 51.6	− 8 52.6	+1.0670	0.6029	0.0062	+68	+30
31 Sagittarii	6½	+2.37	+7.6	−22 3.0	2 22.1	− 8 23.3	+0.8231	0.6027	−0.0050	+68	+11
33 Sagittarii	6	+2.37	+7.7	−21 29.7	3 6.5	− 7 40.7	+0.2609	0.6025	−0.0030	+30	−22

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JULY.

The Star's		Red'ns from 1888.0.		Apparent Declination.	At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	$\Delta\alpha$	$\Delta\delta$		Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		s	″	° ′	d h m	h m				°	°
ξ^1 Sagittarii	5½	+2.36	+ 8.0	−20 48.0	21 4 25.7	− 6 24.7	−0.4444	0.6022	+0.0001	−10	−67
ξ^2 Sagittarii	3½	2.36	8.0	21 15.0	4 34.3	− 6 16.5	+0.0101	0.6022	0.0005	+15	−37
o Sagittarii	3½	2.38	8.3	21 54.2	7 16.6	− 3 40.6	+0.6813	0.6022	0.0069	+63	+ 2
π Sagittarii	3	2.37	8.6	21 11.9	9 17.3	− 1 44.7	−0.0135	0.6015	0.0118	+15	−38
50 Sagittarii	6	2.39	9.3	21 59.6	15 47.2	+ 4 29.8	+0.9204	0.5995	0.0275	+68	+18
f Sagittarii	5	+2.37	+10.3	−20 1.6	23 46.8	−11 49.5	−0.7814	0.5974	+0.0463	−24	−90
σ Capricorni	5½	2.34	11.6	19 27.8	22 13 4.8	+ 0 57.5	−0.5416	0.5909	0.0759	− 8	−75
π Capricorni	5	2.32	11.9	18 34.5	16 20.6	+ 4 5.9	−1.1940	0.5895	0.0826	−53	−90
o Capricorni	6	2.31	12.0	18 56.9	17 22.8	+ 5 5.7	−0.7235	0.5885	0.0845	−17	−90
v Capricorni	5½	2.29	12.4	18 31.8	21 34.3	+ 9 7.6	−0.7794	0.5861	0.0937	−20	−90
19 Capricorni	6	+2.27	+13.0	−18 20.6	23 3 43.2	− 8 57.2	−0.3619	0.5828	+0.1054	+ 5	−60
20 Capricorni	6½	2.27	13.3	19 27.9	5 43.2	− 7 1.6	+1.0100	0.5818	0.1091	+71	+24
21 Capricorni	6½	2.26	13.2	17 57.7	6 16.4	− 6 29.7	−0.4794	0.5813	0.1103	− 1	−69
θ Capricorni	4	2.25	13.3	17 40.4	8 25.4	− 4 25.5	−0.5360	0.5789	0.1141	− 3	−74
30 Capricorni	5½	2.23	13.7	18 27.0	13 31.9	+ 0 29.9	+0.8742	0.5761	0.1233	+71	+14
31 Capricorni	6½	+2.22	+13.7	−17 55.7	13 40.3	+ 0 38.0	+0.3518	0.5758	+0.1234	+46	−17
ι Capricorni	4½	2.21	13.7	17 18.5	15 23.4	+ 2 17.4	−0.0759	0.5740	0.1266	+23	−42
γ Capricorni	3½	2.16	14.0	17 9.8	23 8.6	+ 9 45.9	+0.8044	0.5686	0.1388	+73	+ 9
45 Capricorni	6½	2.14	13.9	15 15.5	24 0 54.2	+11 27.8	−0.9288	0.5678	0 1414	−24	−90
δ Capricorni	2½	2.14	14.1	16 37.9	2 12.4	−11 16.7	+0 6844	0.5665	0 1433	+72	+ 1
ι Aquarii	4½	+2.07	+14.1	−14 24.6	10 54.9	− 2 52.3	−0.3293	0.5605	+0.1552	+13	−57
39 Aquarii	6½	2.05	14.3	14 44.5	13 37.7	− 0 15.1	+0.4433	0.5588	0.1590	+57	−13
42 Aquarii	5½	2.03	14.2	13 23.1	15 38.2	+ 1 41.4	−0.6561	0.5569	0.1611	− 5	−85
45 Aquarii	6½	2.03	14.3	13 51.7	16 38.5	+ 2 39.6	+0.0052	0.5565	0.1623	+32	−37
50 Aquarii	6	2.01	14.4	14 5.7	19 8.5	+ 5 4.5	+0.6604	0.5554	0.1654	+74	− 1
B. A. C. 7835	6½	+1.98	+14.4	−13 29.2	21 43.2	+ 7 34.2	+0.4502	0.5529	+0.1679	+59	−12
70 Aquarii	6	1.92	14.1	11 8.6	25 6 24.8	− 8 1.4	−0.5194	0 466	0.1768	+ 5	−71
Lalande 44734	6½	1.90	14.0	10 39.1	8 24.9	− 6 5.2	−0.6860	0.5457	0.1784	− 4	−88
74 Aquarii	6	1.90	14.3	12 12.6	8 46.1	− 5 44.7	+1.0280	0.5454	0.1786	+78	+23
ψ^1 Aquarii	4	1.82	13.7	9 41.6	19 34.3	+ 4 42.8	+0.3386	0.5384	0.1871	+54	−19
χ Aquarii	5½	+1.82	+13.4	− 8 20.0	20 4.2	+ 5 11.8	−1.0160	0.5380	+0.1873	−24	−90
ψ^2 Aquarii	4	1.81	13.8	9 47.5	20 34.6	+ 5 41.2	+0.6313	0.5378	0.1876	+76	− 3
ψ^3 Aquarii	4½	1.81	13.9	10 13.2	21 5.5	+ 6 11.2	+1.1830	0.5374	0.1878	+80	+37
B. A. C. 8274	7	1.68	12.7	6 59.9	26 11 47.9	− 3 33.7	+0.5797	0.5301	0.1957	+74	− 6
14 Ceti	6	1.49	10.2	1 7.1	27 11 55.2	− 4 9.4	−0.9727	0.5196	0.2011	−18	−90
15 Ceti	6½	+1.46	+10.2	− 1 7.1	13 15.1	− 2 51.8	−0.7052	0.5189	+0.2011	− 1	−90
26 Ceti	6	1.36	9.1	+ 0 46.2	28 2 46.2	+10 15.7	−0.0455	0.5159	0.2004	+35	−39
29 Ceti	6½	1.34	8.8	1 24.6	4 58.5	−11 35.7	−0.3042	0.5159	0.2002	+20	−55
33 Ceti	6	1.33	8.7	1 51.1	6 20.4	−10 16.2	−0.5154	0.5153	0.1998	+ 9	−70
35 Ceti	6½	1.32	8.7	1 52.9	7 23.1	− 9 15.3	−0.3370	0.5150	0.1997	+19	−57
f Piscium	5	+1.30	+ 8.1	+ 3 1.6	10 10.5	− 6 32.7	−1.0370	0.5150	+0.1991	−23	−87
v Piscium	4½	1.19	6.8	4 55.3	22 43.9	+ 5 39.2	−0.6393	0.5139	0.1953	+ 2	−80
64 Ceti	5½	1.07	4.9	8 2.8	29 14 38.2	− 2 53.7	−1.0330	0.5144	0.1879	−23	−82
ξ^1 Ceti	4½	1.07	4.7	8 19.4	15 30.1	− 2 3.3	−1.1770	0.5144	0.1874	−35	−82
ξ^2 Ceti	4½	0.99	4.3	7 57.6	23 32.5	+ 5 45.3	+0.7129	0.5154	0.1825	+90	+ 4
B. A. C. 830	6	+0.93	+ 3.1	+10 15.9	30 7 4.4	−10 55.9	−0.4807	0 5162	+0.1770	+11	−64
μ Ceti	4½	0.92	3.2	9 38.5	8 21.4	− 9 41.1	+0.4347	0.5165	0.1762	+64	−10
Lalande 5725	6	0.84	1.5	12 45.5	19 33.1	+ 1 11.2	−1.0920	0.5200	.0.1670	−28	−77
f Tauri	4	+0.71	+ 0.9	+12 33.1	31 8 11.9	−10 32.3	+1.1730	0.5236	+0.1550	+90	+40

AUGUST.

B. A. C. 1272	6	+0.56	− 1.5	+17 2.4	1 2 53.6	+ 7 35.4	−1.0900	0.5311	+0.1334	−30	−73
δ^1 Tauri	4	0.49	1.8	17 16.8	10 17.8	− 9 14.0	−0.4026	0.5338	0.1240	+15	−52
63 Tauri	6	0.48	1.7	16 30.8	10 33.0	− 8 59.3	+0.4743	0.5339	0.1232	+68	− 2
δ^2 Tauri	5½	+0.48	− 1.9	+17 11.0	10 52.3	− 8 40.6	−0.2243	0.5342	+0.1230	+25	−40
δ^3 Tauri	5	+0.48	− 2.0	+17 40.2	11 32.9	− 8 1.3	−0.6784	0.5347	+0.1219	− 1	−71

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS

AUGUST.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1888.0. Δα	Δδ	Apparent Declination	Washington Mean Time.	Hour Angle *H*	*Y*	*x'*	*y'*	N.	S.
		s	″	° ′	d h m	h m				°	°
75 Tauri	6½	+0.45	−1.6	+16 6.5	1 13 2.2	− 6 34.7	+1.2250	0.5353	+0.1198	+90	+51
B. A. C. 1468	6½	0.38	2.7	18 31.8	21 41.0	+ 1 47.8	−0.4606	0.5394	0.1077	+11	−53
i Tauri	5½	0.36	2.8	18 38.9	2 0 8.6	+ 4 10.7	−0.3285	0.5411	0.1042	+19	−44
m Tauri	5½	0.29	3.0	18 29.5	7 49.4	+11 36.8	+0.5971	0.5448	0.0922	+80	+ 9
ζ Tauri	3½	0.16	4.0	21 4.3	22 1.6	+ 1 21.1	−1.0870	0.5503	0.0684	−32	−69
χ^1 Orionis	4½	+0.09	−4.0	+20 15.1	3 5 48.7	+ 8 52.7	+0.2873	0.5535	+0.0545	+56	− 5
χ^2 Orionis	6	0.09	3.8	19 43.4	6 4.3	+ 9 7.8	+0.8784	0.5535	0.0541	+90	+29
χ^3 Orionis	6	0.05	3.8	19 41.4	9 58.8	−11 5.5	+1.1130	0.5558	0.0470	+90	+46
χ^4 Orionis	5	0.05	3.9	20 8.3	10 11.0	−10 53.8	+0.6316	0.5560	0.0466	+85	+15
68 Orionis	6	+0.02	3.9	19 48.8	13 53.6	− 7 18.7	+1.1450	0.5569	0.0397	+90	+53
15 Geminorum	6½	−0.03	−4.2	+20 51.4	21 1.2	− 0 25.6	+0.2441	0.5605	+0.0260	+52	− 4
16 Geminorum	6½	0.03	4.1	20 33.7	21 6.1	− 0 20.9	+0.5659	0.5605	0.0258	+78	+13
ν Geminorum	4½	0.03	4.0	20 16.8	21 34.1	+ 0 6.2	+0.8827	0.5605	0.0249	+90	+34
d Geminorum	6	0.12	4.3	21 53.5	4 7 40.5	+ 9 51.8	−0.7103	0.5630	+0.0052	− 4	−67
ζ Geminor. *mult.*	4	0.15	4.0	20 43.9	13 18.0	− 8 42.6	+0.5386	0.5650	−0.0063	+75	−14
δ Geminorum	3½	−0.20	−4.1	+22 11.2	20 22 0	− 1 53.4	−1.1190	0.5665	−0.0204	−36	−68
56 Geminorum	5½	0.19	3.8	20 39.2	21 12.5	− 1 4.6	+0.5081	0.5669	0.0219	+72	+11
61 Geminorum	6	0.21	3.7	20 28.7	23 24.8	+ 1 3.1	+0.6421	0.5680	0.0268	+87	+18
63 Geminorum	5½	0.22	3.9	21 40.2	23 44.7	+ 1 22.2	−0.6459	0.5680	0.0276	0	−60
79 Geminorum	6½	0.26	3.6	20 35.0	5 7 26.2	+ 8 47.4	+0.2481	0.5684	0.0435	+52	− 7
85 Geminorum	6	−0.28	−3.4	+20 10.6	12 4.8	−10 43.6	+0.4582	0.5689	−0.0524	+68	+ 5
Mercury				20 42.7	15 43.1	− 7 13.1	−0.3168	0.3918	0.0488	+19	−39
Saturn				18 11.5	6 16 20.3	− 7 28.1	+0.2807	0.5556	0.0391	+52	− 3
				NEW	*MOON.*						
Venus				+14 55.0	7 15 31.7	− 9 5.6	+0.7374	0.4408	−0.1040	+90	+13
B. A. C. 3837	6½	−0.14	0.0	8 40.4	9 4 13.3	+ 2 20.3	+0.8646	0.5598	0.1936	+90	+14
ν Virginis	4	−0.03	+0.6	7 9.4	18 43.9	− 7 38.6	−0.4795	0.5571	0.2051	+11	−66
b Virginis	5½	+0.04	0.3	4 16.7	10 1 10.8	− 1 24.8	+1.1280	0.5565	0.2090	+90	+31
c Virginis	5½	0.11	0.7	3 56.2	10 32.5	+ 7 38.0	−0.5017	0.5560	0.2133	+10	−68
B. A. C. 4254	6	+0.19	+0.8	+ 2 28.3	18 47.4	− 8 23.8	−0.7758	0.5558	−0.2155	− 5	−74
80 Virginis	6	0.50	0.4	− 4 49.5	11 20 49.3	− 7 14.6	+1.0290	0.5588	0.2137	+85	+22
88 Virginis	6½	0.57	0.2	6 16.7	12 2 35.5	− 1 40.2	+1.2750	0.5593	0.2111	+84	+46
ξ^1 Libræ	6	0.97	0.3	11 26.5	13 7 55.4	+ 2 38.6	+0.5953	0.5670	0.1887	+71	− 5
ξ^2 Libræ	5½	0.99	0.6	10 57.5	8 58.2	+ 3 39.2	−0.0894	0.5675	0.1875	+28	−42
17 Libræ	7	+0.99	+0.7	−10 42.2	9 37.6	+ 4 17.2	−0.4706	0.5675	−0.1868	+ 8	−67
18 Libræ	6½	0.99	0.7	10 41.7	9 54.4	+ 4 33.5	−0.5313	0.5678	0.1866	+ 5	−72
B. A. C. 5070	6	1.15	1.2	11 58.1	20 42.1	− 9 2.0	−1.1875	0.5722	0.1736	−41	−90
γ Libræ	4½	1.23	0.8	14 24.9	14 1 39.1	− 4 15.7	+0.4453	0.5740	0.1668	+58	−12
η Libræ	6	1.28	0.7	15 18.9	5 17.0	− 0 45.7	+0.7590	0.5758	0.1615	+75	+ 6
θ Libræ	4½	+1.34	+0.7	−16 24.0	9 23.2	+ 3 11.5	+1.2120	0.5773	−0.1553	+75	+42
49 Libræ	6	1.39	1.0	16 12.2	12 10.2	+ 5 52.4	+0.5818	0.5782	0.1509	+66	− 5
χ Ophiuchi	4½	1.56	1.3	18 12.1	23 14.9	− 7 27.6	+1.0420	0.5829	0.1320	+72	+26
φ Ophiuchi	4½	1.57	2.2	16 22.1	15 0 59.3	− 5 47.1	−1.0440	0.5835	0.1287	−34	−90
24 Scorpii	5½	1.64	2.2	17 31.5	5 16.4	− 1 39.7	−0.4036	0.5849	0.1208	+ 5	−63
29 Ophiuchi	6½	+1.75	+2.7	−18 43.2	13 33.2	+ 6 18.3	−0.1250	0.5876	−0.1037	+17	−44
B. A. C. 6098	6	2.06	4.8	20 44.0	16 14 2.3	+ 5 50.8	+0.0102	0.5936	0.0508	+20	−36
u Sagittarii	4	2.12	5.2	21 5.2	18 29.6	+10 7.6	+0.1681	0.5944	0.0403	+28	−27
14 Sagittarii	6	2.13	5.1	21 44.4	18 40.8	+10 18.4	+0.8268	0.5944	0.0401	+68	+12
15 Sagittarii	5½	2.12	5.4	20 45.5	19 4.8	+10 41.5	−0.1901	0.5944	0.0394	+ 8	−49
16 Sagittarii	6½	+2.12	+5.6	−20 25.1	19 5.3	+10 42.0	−0.5364	0.5944	−0.0391	−11	−75
21 Sagittarii	5	2.16	5.9	20 36.1	23 8.3	− 9 24.5	−0.4889	0.5942	0.0301	− 9	−70
B. A. C. 6336	6	2.22	6.4	21 29.3	17 4 8.6	− 4 35.9	+0.2976	0.5942	0.0178	+33	−20
B. A. C. 6347	6	2.22	6.5	21 8.4	4 32.8	− 4 12.6	−0.0663	0.5942	0.0166	+13	−41
29 Sagittarii	5½	2.25	7.2	20 27.0	8 52.4	− 0 3.1	−0.8213	0.5939	0.0068	−30	−90
30 Sagittarii	6½	+2.28	+6.9	−22 17.3	9 18.4	+ 0 21.8	+1.0520	0.5939	−0.0059	+68	+29
31 Sagittarii	6½	+2.28	+7.0	−22 3.0	9 49.7	+ 0 51.9	+0.8060	0.5938	−0.0044	+68	+10

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

AUGUST.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1888.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	″	° ′	d h m	h m				°	°
33 Sagittarii	6	+2.28	+ 7.2	−21 29.7	17 10 35.3	+ 1 35.8	+0 2368	0.5938	−0.0026	+28	−23
ξ^1 Sagittarii	5½	2.29	7.5	20 48.0	11 56.4	+ 2 53.7	−0.4735	0.5938	+0.0005	−11	−69
ξ^2 Sagittarii	3½	2.29	7.5	21 15.0	12 5.2	+ 3 2.1	−0.0136	0 5938	0.0007	+14	−38
o Sagittarii	3½	2.32	7.7	21 54.2	14 51.7	+ 5 42.2	+0.6659	0.5934	0.0073	+62	+ 1
π Sagittarii	3	2.33	8.1	21 11.9	16 55.2	+ 7 40.9	−0.0358	0.5934	0.0121	+14	−39
50 Sagittarii	6	+2.38	+ 8.7	−21 59.7	23 34.5	− 9 55.2	+0.9128	0.5919	+0.0280	+68	+18
f Sagittarii	5	2.40	10.0	20 1.6	18 7 45.0	− 2 3.6	−0.8029	0.5905	0.0463	−25	−90
σ Capricorni	5½	2.46	11.5	19 27.8	21 19.4	+11 0.0	−0.5550	0.5849	0.0757	− 8	−76
π Capricorni	5	2.46	12.0	18 34.5	19 0 38.0	− 9 48.9	−1.2120	0.5838	0.0825	−55	−90
o Capricorni	6	2.47	12.1	18 56.9	1 42.2	− 8 47.0	−0.7365	0.5831	0.0848	−18	−90
v Capricorni	5½	+2.47	+12.5	−18 31.8	5 58.1	− 4 40.7	−0.7896	0.5815	+0.0933	−21	−90
19 Capricorni	6	2.48	13.1	18 20.6	12 12.8	+ 1 20.2	−0.3643	0.5778	0.1050	+ 5	−60
20 Capricorni	6½	2.49	13.1	19 27.9	14 14.5	+ 3 17.5	+1.0190	0.5775	0.1090	+71	+25
21 Capricorni	6½	2.48	13.3	17 57.7	14 48.4	+ 3 50.2	−0.4809	0.5771	0.1103	− 1	−69
θ Capricorni	4	2.47	13.6	17 40.4	16 59.0	+ 5 56.0	−0.5346	0.5753	0.1142	− 3	−74
30 Capricorni	5½	+2.48	+13.8	−18 27.0	22 9.7	+10 55.5	+0.8855	0.5722	+0.1230	+72	+14
31 Capricorni	6½	2.48	13.8	17 55.7	22 18.1	+11 3.7	+0.3604	0.5719	0.1232	+47	−17
ι Capricorni	4½	2.47	14.0	17 18.5	20 0 2.6	−11 15.5	−0.0677	0.5715	0.1264	+23	−41
γ Capricorni	3½	2.46	14.6	17 9.8	7 52.7	− 3 42.1	+0.8239	0.5672	0.1390	+73	+10
45 Capricorni	6½	2.44	14.8	15 15.5	9 39.2	− 1 59.3	−0.9181	0.5658	0.1417	−23	−90
δ Capricorni	2½	+2.45	+14.8	−16 37.9	10 58.2	− 0 43.1	+0.7055	0.5646	+0.1435	+73	+ 2
ι Aquarii	4½	2.43	15.3	14 24.5	19 44.3	+ 7 45.0	−0.3112	0.5595	0.1556	+13	−56
39 Aquarii	6½	2.43	15.4	14 44.4	22 28.2	+10 23.3	+0.4675	0.5578	0.1593	+59	−11
42 Aquarii	5½	2.41	15.5	13 23.0	21 0 29.2	−11 39.7	−0.6556	0.5560	0.1616	− 4	−83
45 Aquarii	6½	2.41	15.6	13 51.6	1 29.7	−10 41.3	+0.0298	0.5551	0.1627	+33	−35
50 Aquarii	6	+2.41	+15.7	−14 5.6	4 0.3	− 8 15.8	+0.6877	0.5542	+0.1659	+75	+ 1
B. A. C. 7835	6½	2.39	15.8	13 29.1	6 35.5	− 5 45.6	+0.4815	0.5529	0.1688	+62	−11
70 Aquarii	6	2.36	16.0	11 8.5	15 18.0	+ 2 39.7	−0.4868	0.5478	0.1774	+ 7	−68
Lalande 44734	6½	2.36	16.0	10 39.0	17 18.4	+ 4 36.2	−0.6483	0.5469	0.1795	− 2	−84
74 Aquarii	6	2.36	16.1	12 12.5	17 39.5	+ 4 56.6	+1.0660	0.5465	0.1799	+78	+26
ψ^1 Aquarii	4	+2.31	+16.1	− 9 41.5	22 4 26.9	− 8 36.6	+0.3837	0.5409	+0.1887	+58	−16
χ Aquarii	5½	2.31	16.0	8 19.9	4 56.7	− 8 7.8	−0.9716	0.5408	0.1888	−22	−90
ψ^2 Aquarii	4	2.31	16.1	9 47.4	5 27.0	− 7 38.5	+0.6769	0.5400	0.1892	+79	0
ψ^3 Aquarii	4½	2.30	16.2	10 13.1	5 57.8	− 7 8.6	+1.2330	0.5399	0.1894	+80	+42
B. A. C. 8274	7	2.23	15.7	6 59.8	20 36.6	+ 7 2.9	+0.6304	0.5320	0.1972	+78	− 3
14 Ceti	6	+2.12	+14.2	− 1 7.1	23 20 33.3	+ 6 16.5	−0.8841	0.5176	+0.2004	−12	−90
15 Ceti	6½	2.11	14.0	− 1 7.1	21 52.5	+ 7 33.5	−0.6209	0.5178	0.2008	+ 3	−80
26 Ceti	6	2.04	13.0	+ 0 46.2	24 11 16.4	− 3 26.2	+0.0417	0.5195	0.2024	+40	−34
29 Ceti	6½	2.02	12.8	1 24.7	13 27.5	− 1 18.9	−0.2164	0.5195	0.2022	+25	−50
33 Ceti	6	2.02	12.6	1 51.2	14 48.6	− 0 0.1	−0.4255	0.5190	0.2018	+14	−63
35 Ceti	6½	+2.01	+12.5	+ 1 53.0	15 51.0	+ 1 0.4	−0.2491	0.5186	+0.2016	+23	−52
f Piscium	5	2 00	12.1	3 1 7	18 36.9	+ 3 41.6	−0.9453	0.5186	0.2011	−16	−87
ν Piscium	4½	1.93	10.9	4 55.4	25 7 3.8	− 8 13.1	−0.5394	0.5175	0.1971	+ 8	−71
64 Ceti	5½	1.84	9 0	8 2.9	22 51.0	+ 7 7.0	−0.9266	0.5165	0.1892	−15	−82
ξ^1 Ceti	4½	1.84	8.9	8 19.4	23 42.6	+ 7 56.9	−1.0670	0.5165	0.1887	−25	−82
ξ^2 Ceti	4½	+1.77	+ 8.5	+ 7 57.6	26 7 42.1	− 8 17.3	+0.8218	0.5171	+0.1835	+90	+11
B. A. C 830	6	1.73	7.2	10 15.9	15 11.9	− 1 0.6	−0.3684	0.5184	0.1781	+17	−57
μ Ceti	4½	1.71	7.3	9 38.5	16 28.5	+ 0 13.8	+0.5451	0.5183	0.1770	+73	− 5
Lalande 5725	6	1.65	5.5	12 45.6	27 3 38.1	+11 3.9	−0.9779	0.5205	0.1675	−19	−77
f Tauri	4	1.53	4.6	12 33.2	16 16.3	− 0 40.3	+1.2900	0.5234	0.1550	+90	+56
B. A. C. 1272	6	+1.38	+ 1.6	+17 2.4	28 11 0.0	− 6 30.4	−0.9743	0.5314	+0.1330	−20	−73
δ^1 Tauri	4	1.32	1.0	17 16.8	18 26.2	+ 0 42.1	−0.2874	0.5319	0.1230	+21	−44
63 Tauri	6	1.31	1.2	16 30.8	18 41.5	+ 0 57.0	+0.5913	0.5322	0.1228	+79	+ 5
δ^2 Tauri	5½	1.31	1.0	17 11.0	19 0.7	+ 1 15.6	−0.1086	0.5323	0.1225	+31	−33
δ^3 Tauri	5	1 31	+ 0.8	17 40.2	19 41.5	+ 1 55.1	−0.5636	0.5326	0.1215	+ 6	−62
B. A. C. 1468	6½	+1.21	− 0.2	+18 31.8	29 5 53.3	+11 47.8	−0.3456	0.5366	+0.1070	+18	−45
i Tauri	5½	+1.19	− 0.4	+18 38.9	8 21.8	− 9 48.3	−0.2169	0.5376	+0.1035	+25	−37

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

AUGUST.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1888.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	″	° ′	d h m	h m				°	°
m Tauri	5½	+1.10	−0.8	+18 29.6	29 16 6.1	− 2 18.7	+0.7082	0.5409	+0.0913	+90	+15
l Tauri	5½	1.12	1.4	20 16.2	16 15.7	− 2 9.4	−1.2330	0.5412	0.0910	−49	−70
ζ Tauri	3½	0.96	2.5	21 4.4	30 6 25.4	+11 32.7	−0.9854	0.5471	0.0674	−23	−69
χ^1 Orionis	4½	0.87	2.6	20 15.2	14 16.8	− 4 51.4	+0.3916	0.5496	0.0539	+62	+ 1
χ^2 Orionis	6	0.86	2.4	19 43.5	14 32.5	− 4 36.1	+0.9800	0.5496	0.0532	+90	+36
χ^3 Orionis	6	+0.82	−2.6	+19 41.5	18 29.2	− 0 47.3	+1.2110	0.5514	+0.0460	+90	+58
χ^4 Orionis	5	0.82	2.8	20 8.4	18 41.5	− 0 35.5	+0.7328	0.5514	0.0456	+90	+22
68 Orionis	6	0.78	2.8	19 48.9	22 26.2	+ 3 1.8	+1.2470	0.5545	0.0388	+90	+64
15 Geminorum	6½	0.70	3.5	20 51.4	31 5 37.8	+ 9 58.8	+0.3406	0.5558	0.0252	+60	+ 1
16 Geminorum	6½	0.70	3.4	20 33.7	5 42.8	+10 3.6	+0.6630	0.5558	0.0252	+90	+19
ν Geminorum	4½	+0.69	−3.4	+20 16.8	6 10.9	+10 30.8	+0.9800	0.5560	+0.0244	+90	+39
d Geminorum	6	0.59	4.3	21 53.5	16 22.8	− 3 38.1	−0.6233	0.5593	+0.0047	+ 1	−57
ζ Geminor. *mult.*	4	+0.52	−4.1	+20 43.9	22 3.0	+ 1 50.3	+0.6240	0.5614	−0.0068	+85	+18

SEPTEMBER.

δ Geminorum	3½	+0.46	−4.6	+22 11.2	1 5 10.5	+ 8 43.1	−1.0430	0.5632	−0.0211	−28	−68
56 Geminorum	5½	0.44	4.1	20 39.2	6 1.3	+ 9 32.1	+0.5878	0.5637	0.0214	+80	+15
61 Geminorum	6	0.42	4.1	20 28.7	8 14.5	+11 40.7	+0.7191	0.5636	0.0272	+90	+22
63 Geminorum	5½	0.42	4.5	21 40.2	8 34.4	+11 59.8	−0.5706	0.5639	0.0277	+ 4	−53
79 Geminorum	6½	+0.34	−4.2	+20 35.0	16 18.7	− 4 32.1	+0.3168	0.5648	−0.0434	+57	− 2
85 Geminorum	6	0 29	4.2	20 10.6	20 57.9	− 0 2.6	+0.5256	0.5661	0.0531	+74	+ 9
B. A. C 2788	6	0.20	4.3	21 5.9	2 7 48.3	+10 24.9	−1.1470	0.5678	0.0748	−38	−69
θ Cancri	5½	0.15	3.6	18 28.2	12 47.9	− 7 46.1	+1.2380	0.5688	0.0847	+90	+58
35 Cancri	6½	0.14	4.0	19 58.4	14 24.3	− 7 13.1	−0.4895	0.5688	0.0880	+10	−54
39 Cancri	6½	+0.12	−3.9	+20 24.1	16 29.9	− 5 12.0	−1.1280	0.5684	−0.0919	−35	−70
40 Cancri	6½	0.12	4.0	20 21.9	16 32.1	− 5 9.9	−1.0910	0.5684	0.0923	−31	−70
ϵ Cancri	6½	0.12	3.9	19 56.5	16 39.2	− 5 3.0	−0.6572	0.5684	0.0925	0	−66
δ Cancri	4	0.11	3.6	18 33.8	18 32.1	− 3 14.0	+0.6176	0.5682	0.0955	+83	+10
80 Cancri	6½	0.02	3.3	18 30.1	3 6 29.5	+ 8 17.9	−0.5969	0.5690	0.1188	+ 4	−64
Saturn				+17 15.8	7 22.6	+ 9 9.1	+0.5932	0.5567	−0.0390	+78	+ 6
83 Cancri	5½	+0.01	−3.1	18 10.7	9 35.2	+11 17.1	−0.6342	0.5688	0.1241	+ 2	−67
8 Leonis	5½	−0.03	−2.7	+16 56.3	17 31.9	− 5 3.1	−0.3779	0.5682	0.1378	+16	−50
				NEW	*MOON.*						
80 Virginis	6	+0.22	+1.2	− 4 49.5	8 3 34.6	+ 1 18.2	+0.8978	0.5674	−0.2176	+85	+13
88 Virginis	6½	0.28	1.2	6 16 7	9 12.3	+ 6 44.2	+1.1390	0.5671	0.2151	+84	+31
ξ^1 Libræ	6	0.57	1.4	11 26.5	9 13 53.2	+10 23.9	+0.4447	0.5731	0.1913	+60	−13
ξ^2 Libræ	5½	0.58	1.7	10 57.5	14 54.8	+11 23.3	−0.2374	0 5732	0.1901	+21	−51
17 Libræ	7	0.59	1.7	10 42.2	15 33.3	−11 59.6	−0.6137	0.5735	0.1893	0	−80
18 Libræ	6½	+0.59	+1.8	−10 41.7	15 50.0	−11 43.5	−0.6739	0.5733	−0.1890	− 4	−87
γ Libræ	4½	0.80	1.7	14 24.9	10 7 19.3	+ 3 11.8	+0.2864	0.5780	0.1683	+46	−21
η Libræ	6	0.84	1.7	15 18.9	10 54.3	+ 6 38.9	+0.5989	0.5797	0.1629	+69	− 4
θ Libræ	4½	0.90	1.7	16 24.0	14 57.5	+10 33.2	+1.0440	0.5807	0.1562	+74	+25
49 Libræ	6	0.93	1.9	16 12.2	17 42.7	−10 47.7	+0.4235	0.5817	0.1519	+54	−14
χ Ophiuchi	4½	+1.10	+2.0	−18 12.1	11 4 41.9	− 0 13.2	+0.8786	0.5839	−0.1323	+72	+14
ϕ Ophiuchi	4½	1.11	2.8	16 22.1	6 25.7	+ 1 26.6	−1.2000	0.5845	0.1287	−49	−90
24 Scorpii	5½	1.17	2.4	17 31.5	10 41.3	+ 5 32.5	−0.5615	0.5858	0.1208	− 5	−76
29 Ophiuchi	6½	1.30	3.0	18 43.2	18 57.1	−10 30.5	−0.2821	0.5879	0.1041	+ 9	−55
ξ Ophiuchi	5	1.39	2.9	20 59.5	12 2 40.4	− 3 4.9	+1.2830	0.5891	0.0875	+69	+63
58 Ophiuchi	5½	+1.55	+3.6	−21 37.6	11 45.3	+ 5 39.1	+1.2270	0.5903	−0.0676	+68	+49
B. A. C. 6098	6	1.64	4.6	20 44.0	19 31.0	−10 53.2	−0.1377	0.5903	0.0498	+12	−46
μ Sagittarii	4	1.69	4.9	21 5.2	13 0 0.5	− 6 34.1	−0.0170	0.5905	0.0384	+17	−38
14 Sagittarii	6	1.70	5.2	21 44.4	0 11.9	− 6 23.1	+0.6797	0.5906	0.0384	+64	+ 2
15 Sagittarii	5½	1.70	5.1	20 45.5	0 36.1	− 5 59.9	−0.3373	0.5906	0.0384	0	−59
16 Sagittarii	6½	+1.70	+5.2	−20 25.1	0 36.6	− 5 59.5	−0.6849	0.5906	−0.0384	−19	−90
21 Sagittarii	5	+1.75	+5.5	−20 35.9	4 42.0	− 2 3.5	−0.6398	0.5907	−0.0287	−17	−86

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

SEPTEMBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1888.0. $\Delta\alpha$	$\Delta\delta$	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		s	″	° ′	d h m	h m				°	°
B. A. C. 6336	6	+1.82	+ 5.7	−21 29.3	13 9 45.7	+ 2 48.6	+0.1552	0.5893	−0.0171	+25	−28
B. A. C. 6347	6	1.82	5.9	21 8.4	10 10.2	+ 3 12.1	−0.2085	0.5905	0.0164	+ 5	−50
28 Sagittarii	5½	1.87	5.7	22 30.4	13 9.4	+ 6 4.6	+1.1540	0.5891	0.0094	+67	+39
29 Sagittarii	5½	1.87	6.5	20 27.0	14 33.0	+ 7 24.9	−0.9640	0.5889	0.0058	−40	−90
30 Sagittarii	6½	1.89	6.0	22 17.3	14 59.4	+ 7 50.2	+0.9210	0.5897	0.0050	+68	+18
31 Sagittarii	6½	+1.90	+6.1	−22 3.0	15 31.1	+ 8 20.7	+0.6728	0.5893	−0.0036	+62	+ 2
33 Sagittarii	6	1.90	6.4	21 29.7	16 17.2	+ 9 5.0	+0.0993	0.5891	−0.0021	+21	−32
ξ Sagittarii	5½	1.91	6.7	20 48.0	17 39.6	+10 24.3	−0.6130	0.5887	+0.0009	−18	−83
ξ^2 Sagittarii	3½	1.92	6.5	21 15.0	17 48.5	+10 32.8	−0.1507	0.5887	0.0014	+ 7	−46
o Sagittarii	3½	1.96	6.6	21 54.2	20 37.4	−10 44.7	+0.5352	0.5885	0.0082	+49	− 7
π Sagittarii	3	+1.97	+7.1	−21 11.9	22 42.6	− 8 44.3	−0.1698	0.5879	+0.0129	+ 7	−48
50 Sagittarii	6	2.06	7.6	21 59.7	14 5 28.2	− 2 14.1	+0.7903	0.5858	0.0282	+68	+ 9
f Sagittarii	5	2.12	9.1	20 1.6	13 47.1	+ 5 46.0	−0.9292	0.5837	0.0466	−33	−90
σ Capricorni	5½	2.23	10.5	19 27.8	15 3 36.8	− 4 55.1	−0.6673	0.5784	0.0763	−14	−90
o Capricorni	6	2.26	10.9	18 56.9	8 4.8	− 0 36.9	−0.8437	0.5767	0.0850	−23	−90
v Capricorni	5½	+2.30	+11.5	−18 31.8	12 25.7	+ 3 34.4	−0.8923	0.5736	+0.0936	−27	−90
19 Capricorni	6	2.34	11.9	18 20.6	18 47.9	+ 9 43.0	−0.4547	0.5715	0.1052	+ 1	−67
20 Capricorni	6½	2.36	11.9	19 27.9	20 52.1	+11 42.7	+0.9388	0.5698	0.1090	+71	+18
21 Capricorni	6½	2.35	12.3	17 57.7	21 26.5	−11 44.2	−0.5697	0.5693	0.1101	− 6	−77
θ Capricorni	4	2.37	12.5	17 40.4	23 39.8	− 9 35.6	−0.6230	0.5689	0.1139	− 9	−83
30 Capricorni	5½	+2.40	+12.8	−18 27.0	16 4 56.6	− 4 30.0	+0.8198	0.5658	+0.1231	+72	+10
31 Capricorni	6½	2.39	12.9	17 55.7	5 5.0	− 4 21.9	+0.2884	0.5657	0.1234	+42	−21
ι Capricorni	4½	2.40	13.1	17 18.5	6 51.6	− 2 39.0	−0.1399	0.5644	0.1262	+20	−45
γ Capricorni	3½	2.43	13.7	17 9.8	14 50.6	+ 5 3.4	+0.7684	0.5607	0.1390	+73	+ 6
45 Capricorni	6½	2.43	14.2	15 15.5	16 39.2	+ 6 48.3	−0.9861	0.5604	0.1417	−28	−90
δ Capricorni	2½	+2.44	+14.0	−16 37.9	17 59.5	+ 8 5.8	+0.6556	0.5595	+0.1436	+70	− 1
ι Aquarii	4½	2.46	14.9	14 24.6	17 2 55.2	− 7 16.5	−0.3544	0.5547	0.1560	+11	−59
39 Aquarii	6½	2.47	14.9	14 44.5	5 41.8	− 4 35.4	+0.4338	0.5522	0 1591	+57	−13
42 Aquarii	5½	2.47	15.3	13 23.0	7 45.1	− 2 56.2	−0.6732	0.5520	0.1618	− 6	−88
45 Aquarii	6½	2.47	15.3	13 51.6	8 46.5	− 1 36.8	−0.0018	0.5511	0.1631	+31	−37
50 Aquarii	6	+2.48	+15.4	−14 5.6	11 19.5	+ 0 51.1	+0 6661	0.5492	+0.1658	+74	0
B. A. C. 7835	6½	2.48	15.6	13 29.1	13 57.2	+ 3 23.7	+0.4584	0.5482	0.1690	+59	−12
70 Aquarii	6	2.50	16.1	11 8.5	22 47.4	+11 56.8	−0.4972	0.5440	0.1780	+ 7	−70
Lalande 44734	6½	2.50	16.1	10 39.0	18 0 49.3	−10 5.2	−0.6589	0.5424	0.1798	− 3	−85
74 Aquarii	6	2.51	16.1	12 12.5	1 10.7	− 9 44.5	+1.0660	0.5421	0.1801	+78	+26
ψ^1 Aquarii	4	+2 52	+16.4	− 9 41.5	12 6.1	+ 0 50.3	+0.4011	0.5367	+0.1890	+59	−15
χ Aquarii	5½	2.52	16.5	8 19.9	12 36.2	+ 1 19.5	−0.9607	0.5365	0 1891	−20	−90
ψ^2 Aquarii	4	2.52	16.5	9 47.4	13 6.9	+ 1 49.1	+0.6969	0.5360	0.1895	+80	+ 1
ψ^3 Aquarii	4½	2.52	16.6	10 13.1	13 37.8	+ 2 19.1	+1.2510	0.5360	0.1899	+80	+44
B. A. C. 8274	7	2.52	16.5	6 59.8	19 4 25.0	− 7 20.9	+0.6767	0.5308	0.1985	+82	− 1
14 Ceti	6	+2.50	+16.0	− 1 7.0	20 4 28.9	− 8 0.1	−0.8116	0.5236	+0 2049	− 8	−90
15 Ceti	6½	2.49	15.9	− 1 7.0	5 48.4	− 6 42 9	−0.5399	0 5232	0.2051	+ 9	−72
26 Ceti	6	2.48	15.2	+ 0 46.3	19 13.7	+ 6 18.8	+0.1528	0.5201	0.2044	+46	−29
29 Ceti	6½	2.48	15.0	1 24.8	21 24.8	+ 8 26.2	−0.0927	0.5196	0.2039	+32	−42
33 Ceti	6	2.48	14.9	1 51.2	22 45.9	+ 9 45.0	−0.3061	0.5202	0.2041	+21	−56
35 Ceti	6½	+2.48	+14.8	+ 1 53.0	23 48.1	+10 45.3	−0.1275	0.5188	+0.2037	+31	−45
f Piscium	5	2.47	14 5	3 1.7	21 2 33.9	−10 33.7	−0.8181	0.5189	0.2030	− 7	−87
ν Piscium	4½	2.46	13.6	4 55.4	14 59.7	+ 1 30.6	−0.3950	0.5183	0.1990	+16	−61
64 Ceti	5½	2 43	11.9	8 2.9	22 6 44.4	− 7 11.9	−0.7579	0.5180	0.1910	− 4	−77
ξ^1 Ceti	4½	2.42	11.8	8 19.5	7 35.8	− 6 22.1	−0.8991	0.5182	0.1905	−13	−82
ξ^2 Ceti	4½	+2.39	+11.2	+ 7 57.7	15 33.8	+ 1 22.1	+1.0000	0.5186	+0.1854	+90	+22
B. A. C. 830	6	2.38	10.2	10 16.0	23 2.3	+ 8 37.5	−0.1805	0.5196	0.1798	+27	−34
μ Ceti	4½	2.36	10.2	9 38.6	23 0 18.5	+ 9 51.5	+0.7348	0.5195	0.1786	+90	+ 6
Lalande 5725	6	2.34	8.6	12 45.6	11 26.3	− 3 20.2	−0.7767	0.5216	0.1688	− 6	−77
B. A. C. 1272	6	2.17	4.1	17 2.5	24 18 47.3	+ 3 4.6	−0.7506	0.5295	0.1339	− 5	−73
δ^1 Tauri	4	+2.11	+ 3.2	+17 16.9	25 2 14.7	+10 18.3	−0.0573	0.5317	+0.1239	+34	−31
63 Tauri	6	+2.10	+ 3.4	+16 30.9	2 30.0	+10 33.2	+0.8226	0.5319	+0.1233	+90	+18

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

SEPTEMBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1888.0. $\Delta\alpha$	$\Delta\delta$	Apparent Declination	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		s	″	° ′	d h m	h m				°	°
δ^2 Tauri	5½	+2.11	+3.2	+17 11.1	25 2 49.3	+10 51.7	+0.1201	0.5317	+0.1229	+44	-21
δ^3 Tauri	5	2.10	3.0	17 40.3	3 30.2	+11 31.5	-0.3364	0.5319	0.1220	+19	-46
B. A. C. 1468	6½	2.02	1.7	18 31.8	13 44.6	- 2 33.1	-0.1126	0.5351	0.1072	+31	-32
i Tauri	5½	2.00	1.4	18 38.9	16 13.9	- 0 8.5	+0.0185	0.5358	0.1035	+39	-24
m Tauri	5½	1.93	0.7	18 29.6	26 0 1.2	+ 7 24.1	+0.9466	0.5387	0.0910	+90	+30
l Tauri	5½	+1.95	+0.2	+20 16.2	0 11.3	+ 7 33.8	-1.0020	0.5387	+0.0910	-23	-70
ζ Tauri	3½	1.81	-1.6	21 4.4	14 28.0	- 2 36.9	-0.7556	0.5437	0.0670	- 6	-69
χ^1 Orionis	4½	1.72	2.0	20 15.2	22 24.6	+ 5 4.8	+0.6282	0.5455	0.0530	+85	+14
χ^2 Orionis	6	1.71	1.8	19 43.5	22 40.4	+ 5 19.5	+1.2220	0.5455	0.0528	+90	+59
χ^4 Orionis	5	1.66	2.3	20 8.4	27 2 52.7	+ 9 23.5	+0.9707	0.5478	0.0453	+90	+36
15 Geminorum	6½	+1.54	-3.6	+20 51.4	13 57.8	- 3 53.4	+0.5702	0.5503	+0.0248	+78	+14
16 Geminorum	6½	1.53	3.5	20 33.7	14 3.0	- 3 48.3	+0.8962	0.5503	0.0246	+90	+33
ν Geminorum	4½	1.53	3.4	20 16.8	14 31.5	- 3 20.7	+1.2150	0.5505	0.0237	+90	+60
d Geminorum	6	1.41	4.7	21 53.5	28 0 52.7	+ 6 39.6	-0.4011	0.5537	+0.0038	+14	-39
ζ Geminor. *mult.*	4	1.34	4.7	20 43.9	6 38.4	-11 46.4	+0.8496	0.5554	-0.0072	+90	+32
δ Geminorum	3½	+1.25	-5.5	+22 11.2	13 53.1	- 4 46.4	-0.8339	0.5571	-0.0216	-12	-68
56 Geminorum	5½	1.24	5.0	20 39.2	14 44.8	- 3 56.5	+0.8068	0.5573	0.0233	+90	+28
61 Geminorum	6	1.20	5.1	20 28.7	17 0.3	- 1 45.6	+0.9369	0.5573	0.0278	+90	+36
63 Geminorum	5½	1.20	5.5	21 40.2	17 20.7	- 1 25.9	-0.3620	0.5573	0.0283	+17	-39
79 Geminorum	6½	1.10	5.5	20 35.0	29 1 13.6	+ 6 10.7	+0.5259	0.5591	0.0437	+74	+10
85 Geminorum	6	+1.03	-5.5	+20 10.6	5 57.2	+10 44.6	+0.7298	0.5595	-0.0533	+90	+20
B. A. C. 2788	6	0.89	6.3	21 5.9	16 59.2	- 2 36.2	-0.9645	0.5613	0.0750	-21	-69
η Cancri	5½	0.82	6.3	20 49.1	22 31.1	+ 2 44.1	-1.1070	0.5620	0.0859	-33	-69
35 Cancri	6½	0.80	6.1	19 58.4	23 41.9	+ 3 52.4	-0.3116	0.5613	0.0879	+20	-41
39 Cancri	6½	0.77	6.2	20 24.1	30 1 49.6	+ 5 55.7	-0.9574	0.5622	0.0920	-20	-70
40 Cancri	6½	+0.77	-6.2	+20 21.9	1 51.8	+ 5 57.8	-0.9222	0.5622	-0.0922	-17	-70
ε Cancri	6½	0.77	6.0	19 56.5	1 59.2	+ 6 5.0	-0.4850	0.5624	0.0924	+10	-54
δ Cancri	4	0.75	5.7	18 33.8	3 53.8	+ 7 55.6	+0.7986	0.5624	0.0961	+90	+20
80 Cancri	6½	0.61	5.8	18 30.1	16 2.6	- 4 21.0	-0.4422	0.5632	0.1186	+13	-54
83 Cancri	5½	+0.58	-5.6	18 10.7	19 11.0	- 1 19.1	-0.4816	0.5636	0.1242	+10	-56
Saturn				+16 25.7	22 17.1	+ 1 40.5	+0.9579	0.5527	-0.0386	+90	+27

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8 Leonis	5½	+0.49	-5.4	+16 56.2	1 3 13.9	+ 6 26.9	-0.2349	0.5590	-0.1372	+24	-41
34 Leonis	6½	+0.35	-4.5	+13 54.4	18 39.3	- 2 39.8	+0.5845	0.5639	-0.1633	+78	+ 1
37 Leonis	5½	0.33	4.4	14 17.1	20 54.1	- 0 29.7	-0.1773	0.5636	0.1663	+27	-41
l Leonis	5½	0.22	3.3	11 8.2	2 11 25.9	-10 28.2	+0.4931	0.5640	0.1865	+69	- 7
B. A. C. 3837	6½	0.16	2.5	8 40.4	22 28.2	+ 0 11.1	+0.8712	0.5644	0.1992	+90	+23
ν Virginis	4	0.12	-1.8	+ 7 9.4	3 12 37.6	-10 9.1	-0.5058	0.5649	0.2118	+19	-68
				NEW	*MOON.*						
ξ^1 Libræ	6	+0.30	+2.1	-11 26.5	6 22 1.8	- 3 39.8	+0.2768	0.5824	-0.1963	+50	-22
ξ^2 Libræ	5½	0.31	2.2	10 57.5	23 1.5	- 2 42.3	-0.3954	0.5826	0.1952	+12	-62
17 Libræ	7	0.31	2.2	10 42.2	23 38.9	- 2 6.3	-0.7676	0.5528	0.1944	- 9	-90
18 Libræ	6½	+0.31	+2.3	-10 41.7	23 54.9	- 1 50.8	-0.8285	0.5829	-0.1939	-12	-90
γ Libræ	4½	0.45	2.4	14 24.9	7 14 54.7	-11 25.1	+0.0940	0.5876	0.1726	+36	-32
η Libræ	6	0.48	2.4	15 18.9	18 22.7	- 8 5.1	+0.3968	0.5893	0.1671	+53	-16
θ Libræ	4½	0.52	2.3	16 24.0	22 18.2	- 4 18.4	+0.8299	0.5902	0.1605	+74	+10
49 Libræ	6	0.55	2.5	16 12.2	8 0 58.3	- 1 44.5	+0.2133	0.5906	0.1554	+41	-26
χ Ophiuchi	4½	+0.67	+2.6	-18 12.1	11 37.0	+ 8 29.5	+0.6510	0.5940	-0.1355	+68	- 1
24 Scorpii	5½	0.73	3.3	17 31.4	17 25.6	- 9 55.6	-0.7771	0.5952	0.1235	-17	-90
29 Ophiuchi	4½	0.83	3.4	18 43.1	9 1 27.2	- 2 12.9	-0.5084	0.5956	0.1062	- 4	-72
ξ Ophiuchi	6	0.94	3.3	20 59.4	8 58.3	+ 5 0.4	+1.0320	0.5962	0.0891	+69	+26
58 Ophiuchi	5½	1.05	3.7	21 37.6	17 49.8	-10 29.0	+0.9763	0.5958	0.0689	+68	+22
B. A. C. 6098	6	+1.14	+4.5	-20 44.0	10 1 25.3	- 3 11.5	-0.3770	0.5958	-0.0595	- 2	-62
μ Sagittarii	4	+1.19	+4.7	-21 5.2	5 49.4	+ 1 2.2	-0.2225	0.5952	-0.0401	+ 7	-51

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

OCTOBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1888.0. Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x′	y′	N.	S.
		s	″	° ′	d h m	h m				°	°
14 Sagittarii	6	+1.20	+ 4.5	−21 44.4	10 6 0.5	+ 1 12.9	+0.4324	0.5960	−0.0398	+44	−13
15 Sagittarii	5½	1.19	4.9	20 45.5	6 24.4	+ 1 35.9	−0.5777	0.5957	0.0387	−13	−79
16 Sagittarii	6½	1.19	5.0	20 25.1	6 24.8	+ 1 36.2	−0.9239	0.5957	0.0387	−34	−90
21 Sagittarii	5	1.24	5.3	20 35.9	10 25.7	+ 5 27.6	−0.8782	0.5952	0.0290	−32	−90
B. A. C. 6336	6	1.32	5.3	21 29.3	15 23.9	+10 14.1	−0.0898	0.5936	0.0169	+11	−43
B. A. C. 6347	6	+1.32	+ 5.5	−21 8.4	15 48.5	+10 37.8	−0.4508	0.5936	−0.0161	− 9	−68
28 Sagittarii	5½	1.37	5.3	22 30.4	18 45.1	−10 32.5	+0.9032	0.5930	0.0092	+67	+17
30 Sagittarii	6½	1.39	5.5	22 17.3	20 33.5	− 8 48.3	+0.6688	0.5919	0.0048	+61	+ 1
31 Sagittarii	6½	1.39	5.6	22 3.0	21 4.7	− 8 18.3	+0.4244	0.5916	0.0034	+40	−13
33 Sagittarii	6	1.40	5.8	21 29.7	21 50.2	− 7 34.6	−0.1443	0.5912	0.0017	+ 7	−46
ν^1 Sagittarii	5	+1.41	+ 5.4	−22 52.8	21 52.6	− 7 32.3	+1.2690	0.5921	−0.0017	+67	+62
ν^2 Sagittarii	5	1.41	5.4	22 48.5	22 15.2	− 7 10.5	+1.1960	0.5919	−0.0007	+67	+45
ξ^1 Sagittarii	5½	1.40	6.2	20 48.0	23 11.4	− 6 16.6	−0.8537	0.5915	+0.0017	−35	−90
ξ^2 Sagittarii	3½	1.41	6.1	21 15.0	23 20.2	− 6 8.1	−0.3945	0.5928	0.0017	− 7	−63
o Sagittarii	3½	1.45	6.1	21 54.2	11 2 7.1	− 3 27.7	+0.2857	0.5895	0.0085	+32	−21
π Sagittarii	3	+1.47	+ 6.5	−21 11.9	4 11.1	− 1 28.5	−0.4129	0.5902	+0.0133	− 7	−65
50 Sagittarii	6	1.56	6.8	21 59.7	10 52.7	+ 4 57.7	+0.5462	0.5875	0.0288	+52	− 6
f Sagittarii	5	1.65	8.1	20 1.7	19 8.5	−11 5.3	−1.1630	0.5835	0.0475	−53	−90
σ Capricorni	5½	1.81	9.2	19 27.8	12 8 55.8	+ 2 11.2	−0.8978	0.5768	0.0767	−28	−90
o Capricorni	6	1.85	9.7	18 56.9	13 23.8	+ 6 29.3	−1.0720	0.5740	0.0857	−40	−90
v Capricorni	5½	+1.89	+10.1	−18 31.8	17 45.4	+10 41.4	−1.1180	0.5725	+0.0939	−44	−90
19 Capricorni	6	1.95	10.6	18 20.6	13 0 9.0	− 7 8.7	−0.6759	0.5679	0.1059	−12	−90
20 Capricorni	6½	1.97	10.3	19 27.9	2 13.8	− 5 8.3	+0.7242	0.5670	0.1098	+70	+ 4
21 Capricorni	6½	1.98	10.8	17 57.7	2 48.4	− 4 35.0	−0.7870	0.5667	0.1108	−18	−90
θ Capricorni	4	2.00	11.0	17 40.4	5 2.2	− 2 25.9	−0.8373	0.5656	0.1147	−21	−90
30 Capricorni	5½	+2.05	+11.1	−18 27.0	10 21.5	+ 2 42.2	+0.6113	0.5622	+0.1237	+65	− 3
31 Capricorni	6½	2.05	11.3	17 55.7	10 30.1	+ 2 50.6	+0.0806	0.5619	0.1241	+31	−33
ι Capricorni	4½	2.06	11.5	17 18.5	12 17.5	+ 4 34.3	−0.3473	0.5614	0.1271	+ 9	−59
γ Capricorni	3½	2.13	12.0	17 9.8	20 20.8	−11 39.0	+0.5748	0.5558	0 1390	+64	− 5
45 Capricorni	6½	2 13	12.6	15 15.5	22 10.4	− 9 53.1	−1.1810	0.5547	0.1419	−44	−90
δ Capricorni	2½	+2.16	+12.3	−16 37.9	23 31.8	− 8 34.5	+0.4630	0.5540	+0.1439	+57	−12
ι Aquarii	4½	2.22	13.3	14 24.6	14 8 33.5	+ 0 9.2	−0.5346	0.5492	0.1561	+ 2	−73
39 Aquarii	6½	2.24	13.4	14 44.5	11 22.1	+ 2 52.3	+0.2619	0.5473	0.1595	+45	−23
42 Aquarii	5½	2.26	13.8	13 23.1	13 26.9	+ 4 53.0	−0.8494	0.5463	0.1621	−16	−90
45 Aquarii	6½	2.27	13.7	13 51.7	14 29.1	+ 5 53.2	−0.1720	0.5458	0.1633	+22	−48
50 Aquarii	6	+2.29	+13.7	−14 5.7	17 4 3	+ 8 23.3	+0.5045	0.5444	+0.1664	+63	−10
B. A. C. 7835	6½	2.30	13.9	13 29.2	19 44.0	+10 57.9	+0.3037	0.5424	0.1690	+50	−21
70 Aquarii	6	2.36	14.7	11 8.6	15 4 41.6	− 4 21.6	−0.6448	0.5389	0.1784	− 2	−84
Lalande 44734	6½	2.37	14.9	10 39.1	6 45.2	− 2 21.9	−0.8019	0.5375	0.1802	−11	−90
74 Aquarii	6	2.38	14.5	12 12.6	7 7.2	− 2 0.6	+0.9342	0.5369	0.1805	+78	+16
ψ^1 Aquarii	4	+2.44	+15.2	− 9 41.5	18 12.0	+ 8 43.6	+0.2831	0.5315	+0.1892	+52	−22
χ Aquarii	5½	2.43	15.5	8 19.9	18 42.4	+ 9 13.1	−1.0820	0.5316	0.1894	−28	−90
ψ^2 Aquarii	4	2.44	15.2	9 47.4	19 13.7	+ 9 43.4	+0.5860	0.5313	0.1900	+72	− 6
ψ^3 Aquarii	4½	2.44	15.2	10 13.1	19 45.2	+10 14.0	+1.1460	0.5309	0.1901	+80	+31
B. A. C. 8274	7	2.52	15.8	6 59.8	16 10 44.8	+ 0 46.4	+0.5993	0.5264	0.1993	+76	− 5
14 Ceti	6	+2.61	+16.1	− 1 7.0	17 11 7.2	+ 0 25.8	−0.8383	0.5198	+0.2059	− 9	−90
15 Ceti	6½	2.62	16.0	− 1 7.0	12 27.4	+ 1 43.6	−0.5636	0.5195	0.2061	+ 8	−75
26 Ceti	6	2.67	15.5	+ 0 46.3	18 2 0.2	− 9 7.1	+0.1643	0.5175	0.2057	+47	−29
29 Ceti	6½	2.67	15.5	1 24.8	4 12.9	− 6 58.2	−0.0840	0.5171	0.2053	+34	−43
33 Ceti	6	2.68	15.4	1 51.3	5 34.7	− 5 38.7	−0.2889	0.5177	0.2056	+23	−55
35 Ceti	6½	+2.68	+15.4	+ 1 53.1	6 37.4	− 4 37.9	−0.1079	0.5174	+0.2054	+32	−44
f Piscium	5	2.70	15.3	3 1 8	9 24.3	− 1 55.7	−0.7934	0.5169	0.2046	− 5	−87
ν Piscium	4½	2.74	14.5	4 55.4	21 55 2	+10 13.6	−0.3358	0.5172	0.2009	+20	−57
64 Ceti	5½	2.79	13.1	8 2.9	19 13 43.9	+ 1 35.2	−0.6631	0.5182	0.1936	+ 2	−80
ξ^1 Ceti	4½	2.79	13.1	8 19.5	14 35.4	+ 2 25.1	−0.8011	0.5184	0.1931	− 7	−82
ξ^2 Ceti	4½	+2.79	+12.4	+ 7 57.7	22 34.6	+ 0 10.5	+1.1200	0.5184	+0.1875	+90	+30
B. A. C. 830	6	+2.82	+11.5	+10 16.0	20 6 3.7	− 4 33.5	−0.0443	0.5200	+0.1820	+35	−37

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

OCTOBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1888.0. Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle *H*	*Y*	*x'*	*y'*	N.	S.
		s	″	° ′	d h m	h m				°	°
μ Ceti	4½	+2.81	+11.4	+ 9 38.6	20 7 20.1	− 5 19.3	+0.8746	0.5199	+0.1810	+90	+14
Lalande 5725	6	2.84	10.0	12 45.7	18 28.1	+ 5 29.3	−0.6193	0.5226	0.1712	+ 4	−72
B. A. C. 1272	6	2.82	5.5	17 2.5	22 1 47.6	+11 52.5	−0.5342	0.5293	0.1353	+ 8	−62
δ^1 Tauri	4	2.80	4.5	17 16.9	9 14.7	− 4 54.1	+0.1704	0.5320	0.1256	+48	−18
63 Tauri	6	2.79	4.6	16 30.9	9 30.0	− 4 39.2	+1.0540	0.5321	0.1250	+90	+34
δ^2 Tauri	5½	+2.79	+ 4.5	+17 11.1	9 49.3	− 4 20.5	+0.3500	0.5323	+0.1247	+59	− 9
δ^3 Tauri	5	2.79	4.3	17 40.3	10 30.3	− 3 40.8	−0.1092	0.5328	0.1238	+31	−34
B. A. C. 1468	6½	2.75	2.7	18 31.8	20 44.8	+ 6 14.7	+0.1296	0.5365	0.1087	+14	−20
i Tauri	5½	2.74	2.4	18 38.9	23 14.3	+ 8 39.5	+0.2629	0.5365	0.1052	+54	−11
m Tauri	5½	2.69	1.4	18 29.6	23 7 2.5	− 7 47.0	+1.2050	0.5386	0.0924	+90	+53
l Tauri	5½	+2.71	+ 0.9	+20 16.2	7 12.7	− 7 37.2	−0.7487	0.5383	+0.0924	− 5	−70
ζ Tauri	3½	2.61	− 1.2	21 4.4	21 32.3	+ 6 15.0	−0.4890	0.5424	0.0681	+10	−51
χ^1 Orionis	4½	2.53	1.9	20 15.2	24 5 31.6	−10 1.2	+0.9059	0.5451	0.0542	+90	+31
χ^4 Orionis	5	2.49	2.4	20 8.4	10 1.5	− 5 40.1	+1.2580	0.5458	0.0460	+90	+65
η Geminorum	3½	2.47	3.7	22 32.3	15 8.0	− 0 43.5	−1.1800	0.5465	0.0366	−42	−67
μ Geminorum	3	+2.43	− 4.3	+22 34.1	18 54.8	+ 2 55.8	−1.0890	0.5479	+0.0296	−32	−67
15 Geminorum	6½	2.39	4.0	20 51.4	21 12.6	+ 5 9.1	+0.8622	0.5489	0.0255	+90	+31
16 Geminorum	6½	2.38	4.0	20 33.7	21 17.8	+ 5 14.2	+1.1900	0.5489	0.0254	+90	+57
d Geminorum	6	2.28	5.7	21 53.5	25 8 15.2	− 8 10.2	−0.1154	0.5507	+0.0042	+31	−21
ζ Geminor. *mult.*	4	2.19	6.0	20 43.9	14 5.7	− 2 31.4	+1.1500	0.5517	−0.0069	+90	+54
44 Geminorum	6	+2.21	− 6.6	+22 48.1	14 36.1	− 2 2.0	−1.1250	0.5517	−0.0081	−36	−67
δ Geminorum	3½	2.11	7.2	22 11.2	21 26.7	+ 4 34.9	−0.5483	0.5501	0.0213	+ 6	−52
56 Geminorum	5½	2.09	6.7	20 39.2	22 19.6	+ 5·25.9	+1.1080	0.5524	0.0228	+90	+50
61 Geminorum	6	2.06	6.9	20 28.7	26 0 37.4	+ 7 39.2	+1.2430	0.5531	0.0273	+90	+63
63 Geminorum	5½	2.06	7.3	21 40.2	0 58.3	+ 7 59.4	−0.0710	0.5531	0.0281	+33	−22
79 Geminorum	6½	+1.96	− 7.6	+20 35 0	8 59.4	− 8 15.7	+0.8243	0.5529	−0 0439	+90	+27
85 Geminorum	6	1.89	7.9	20 10.6	13 49.0	− 3 35.8	+1.0330	0.5531	0.0528	+90	+40
μ^2 Cancri	5½	1.82	8.9	21 54.3	19 19.2	+ 1 43.2	−1.1620	0.5538	0.0631	−39	−68
B. A. C. 2788	6	1.74	9.0	21 5.8	27 1 5.4	+ 7 17.7	−0.6833	0.5537	0.0743	− 1	−67
η Cancri	5½	1.65	9.2	20 49.0	6 45.1	−11 14.1	−0.8316	0.5537	0.0850	−11	−69
35 Cancri	6½	+1.63	− 9.0	+19 58.3	7 57.6	−10 4.1	−0.0269	0.5539	−0.0873	+36	−25
39 Cancri	6½	1.61	9.2	20 24.0	10 8.4	− 7 57.7	−0.6797	0.5541	0.0911	− 1	−68
40 Cancri	6½	1.61	9.2	20 21.8	10 10.7	− 7 55.5	−0.6441	0.5541	0.0912	+ 1	−65
ε Cancri	6½	1.60	9.1	19 56.4	10 18.2	− 7 48.1	−0.2021	0.5541	0.0914	+26	−35
δ Cancri	4	1.57	8.7	18 33.8	12 15.8	− 5 54.5	+1.0930	0.5543	0.0948	+90	+41
80 Cancri	6½	+1.39	− 9.3	+18 30.0	28 0 43.4	+ 6 7.7	−0.1720	0.5538	−0.1174	+28	−36
83 Cancri	5½	1.35	9.3	18 10.6	3 56.7	+ 9 14.5	−0.2160	0.5539	0.1230	+25	−39
8 Leonis	5½	1.23	9.1	16 56.1	12 12.7	− 6 46.3	+0.0264	0.5546	0.1370	+39	−27
34 Leonis	6½	1.03	8.4	13 54.4	29 4 3.8	+ 8 32.7	+0.8310	0.5539	0.1617	+90	+15
37 Leonis	5½	1.00	8.4	14 17.1	6 22.1	+10 46.2	+0.0591	0.5537	0.1648	+41	−28
l Leonis	5½	+0.84	− 7.3	+11 8.2	21 17.0	+ 1 10.9	+0.7120	0.5551	−0.1852	+90	+ 6
B. A. C. 3837	6½	0.72	6.5	8 40.3	30 8 35.3	−11 53.7	+1.0740	0.5560	0.1980	+90	+28
v Virginis	4	0.58	5.6	7 9.3	23 2.6	+ 2 4.1	−0.3485	0.5582	0.2115	+19	−57
b Virginis	5½	0.55	4.6	4 16.6	31 5 24.3	+ 8 12.7	+1.2060	0.5599	0.2166	+90	+37
c Virginis	5½	0.47	4.1	3 56.1	14 34.8	− 6 55.8	−0.4624	0.5611	0.2216	+13	−67
B. A. C. 4254	6	+0.42	− 3.4	+ 2 28.2	22 35.8	+ 0 48.5	−0.7816	0.5631	−0.2249	− 5	−72

NOVEMBER.

					NEW MOON.						
θ Libræ	4½	+0.39	+ 2.4	−16 24.0	4 8 14.3	+ 7 25.7	+0.6900	0.5984	−0.1653	+73	+ 1
χ Ophiuchi	4½	0.47	3.0	18 12.0	21 8.9	− 4 10.6	+0.4804	0.6029	0.1402	+57	−11
24 Scorpii	5½	0.50	3.3	17 31.4	5 2 46.1	+ 1 12.9	−0.9361	0.6047	0.1278	−27	−90
29 Ophiuchi	6½	0.56	3.6	18 43.1	10 31.2	+ 8 39.1	−0.6852	0.6064	0.1100	−13	−90
ξ Ophiuchi	5	+0.63	+ 3.7	−20 59.4	17 46.1	− 8 23.9	+0.8156	0.6074	−0.0929	+69	+10
58 Ophiuchi	5½	+0.70	+ 4.1	−21 37.6	6 2 18.5	− 0 12.5	+0.7457	0 6078	−0.0723	+68	+ 5

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

NOVEMBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1888.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	″	° ′	d h m	h m				°	°
B. A. C. 6098	6	+0.77	+ 4.5	−20 44.0	6 9 37.1	+ 6 48.2	−0.5977	0.6075	−0.0531	−13	−82
μ Sagittarii	4	0.82	4.7	21 5.2	13 51.5	+10 52.0	−0.4494	0.6067	0.0423	− 6	−68
14 Sagittarii	6	0.82	4.6	21 44.4	14 2.2	+11 2.4	+0.1940	0.6066	0.0419	+29	−27
15 Sagittarii	5½	0.82	4.8	20 45.5	14 25.1	+11 24.4	−0.7992	0.6066	0.0406	−26	−90
16 Sagittarii	6½	0.82	4.9	20 25.1	14 25.7	+11 24.8	−1.1380	0.6066	0.0406	−50	−90
21 Sagittarii	5	+0.86	+ 5.2	−20 35.9	18 17.8	− 8 52.5	−1.1020	0.6064	−0.0310	−49	−90
B. A. C. 6336	6	0.91	5.2	21 29.3	23 5.5	− 4 16.5	−0.3300	0.6047	0.0185	− 2	−59
B. A. C. 6347	6	0.92	5.3	21 8.4	23 28.7	− 3 54.2	−0.6866	0.6046	0.0175	−22	−90
28 Sagittarii	5½	0.95	5.1	22 30.4	7 2 19.0	− 1 10.9	+0.6411	0.6036	0.0105	+58	− 1
30 Sagittarii	6½	0.97	5.3	22 17.3	4 3.6	+ 0 29.5	+0.4079	0.6032	0.0057	+39	−14
31 Sagittarii	6½	+0.97	+ 5.5	−22 3.0	4 33.8	+ 0 58.5	+0.1672	0.6029	−0.0043	+25	−28
33 Sagittarii	6	0.98	5.5	21 29.7	5 17.8	+ 1 40.7	−0.3929	0.6025	0.0030	− 7	−63
ν^1 Sagittarii	5	0.98	5.2	22 52.8	5 20.1	+ 1 43.0	+0.9965	0.6025	0.0028	+67	+24
ν^2 Sagittarii	5	0.99	5.3	22 48.5	5 41.8	+ 2 3.8	+0.9247	0.6022	−0.0017	+67	+18
ξ^1 Sagittarii	5½	0.99	5.8	20 48.0	6 36.1	+ 2 55.8	−1.0910	0.6025	+0.0003	−50	−90
ξ^2 Sagittarii	3½	+0.99	+ 5.7	−21 15.0	6 44 6	+ 3 3.9	−0.6397	0.6025	+0.0007	−20	−87
o Sagittarii	3½	1.02	5.7	21 54.2	9 25.6	+ 5 38.5	+0.0285	0.6012	0.0077	+17	−36
π Sagittarii	3	1.04	5 9	21 11.9	11 25.3	+ 7 33.4	−0.6610	0.5995	0.0127	−20	−90
50 Sagittarii	6	1.12	6.1	21 59 7	17 53.7	−10 13.7	+0.2766	0.5973	0.0285	+33	−22
σ Capricorni	5½	1.35	8.0	19 27.9	8 15 17.5	+10 20.4	−1.1620	0.5843	0.0774	−50	−90
19 Capricorni	6	+1.52	+ 9.0	−18 20.7	9 6 9.1	+ 0 38.8	−0.9464	0.5735	+0.1069	−29	−90
20 Capricorni	6½	1.54	8.8	19 28.0	8 11.3	+ 2 36.6	+0.4369	0.5719	0.1108	+52	−13
21 Capricorni	6½	1.54	9.3	17 57.7	8 45.2	+ 3 9.2	−1.0580	0.5715	0.1119	−37	−90
θ Capricorni	4	1.56	9.5	17 40.4	10 56.6	+ 5 15.9	−1.1110	0.5698	0.1159	−40	−90
30 Capricorni	5½	1.62	9.5	18 27.0	16 9.7	+10 17.7	+0.3246	0.5659	0.1250	+45	−20
31 Capricorni	6½	+1.62	+ 9.7	−17 55.7	16 18.2	+10 26.0	−0.2014	0.5659	+0.1252	+16	−50
ι Capricorni	4½	1.64	9.9	17 18.5	18 3.8	−11 52.0	−0.6231	0.5639	0.1281	− 7	−83
γ Capricorni	3½	1.72	10.2	17 9.8	10 1 59.9	− 4 12.5	+0.2897	0.5582	0.1407	+45	−22
δ Capricorni	2½	1.75	10.4	16 37.9	5 8.4	− 1 10.5	+0.1818	0.5559	0.1451	+39	−27
ι Aquarii	4½	1.84	11.3	14 24.6	14 4.4	+ 7 27.4	−0.8031	0.5499	0.1573	−14	−90
39 Aquarii	6½	+1.87	+11.3	−14 44.5	16 51.7	+10 9.2	−0.0106	0.5482	+0.1607	+30	−38
42 Aquarii	5½	1.89	11.8	13 23.1	18 55.5	−11 51.1	−1.1130	0.5471	0.1633	−34	−90
45 Aquarii	6½	1.90	11.7	13 51.7	19 57.3	−10 51.3	−0.4410	0.5459	0.1644	+ 8	−66
50 Aquarii	6	1.92	11.7	14 5.7	22 31.3	− 8 22.4	+0.2350	0.5440	0.1675	+45	−25
B. A. C. 7835	6½	1.95	11.9	13 29.2	11 1 10.4	− 5 48.3	+0.0372	0.5428	0.1703	+34	−36
70 Aquarii	6	+2.03	+12.7	−11 8.6	10 6.1	+ 2 50.2	−0.8984	0.5375	+0.1794	−17	−90
Lalande 44734	6½	2.05	12.9	10 39.1	12 9.6	+ 4 49.9	−1.0530	0.5359	0.1809	−27	−90
74 Aquarii	6	2.06	12.4	12 12.6	12 31.3	+ 5 10.9	+0.6761	0.5357	0.1814	+77	− 1
ψ^1 Aquarii	4	2.16	13.1	9 41.6	23 36.4	− 8 4.6	+0.0429	0.5293	0.1900	+37	−35
ψ^2 Aquarii	4	2.17	13.0	9 47.5	12 0 38.3	− 7 4.7	+0.3458	0.5295	0.1911	+55	−19
ψ^3 Aquarii	4½	+2.17	12.9	−10 13.2	1 9.8	− 6 34.1	+0.9067	0.5292	+0.1912	+80	+14
B. A. C. 8274	7	2.31	13.5	6 59.9	16 13.3	+ 8 2.2	+0.3837	0.5222	0.1994	+60	−17
14 Ceti	6	2.51	14.7	1 7.1	13 16 46.6	+ 7 52.5	−1.0000	0.5115	0.2046	−18	−90
15 Ceti	6½	2.53	14.6	− 1 7.1	18 7.8	+ 9 11.4	−0.7231	0.5158	0.2065	− 2	−90
26 Ceti	6	2.64	14.4	+ 0 46.2	14 7 48.5	− 1 31.4	+0.0292	0.5136	0.2064	+40	−36
29 Ceti	6½	+2.66	+14.4	+ 1 24.7	10 2.0	+ 0 38.4	−0.2162	0.5139	+0.2064	+27	−51
33 Ceti	6	2.67	14.4	1 51.2	11 24.8	+ 1 58.8	−0.4176	0.5136	0.2063	+16	−64
35 Ceti	6½	2.68	14.4	1 53.0	12 27.9	+ 3 0.0	−0.2326	0.5135	0.2061	+26	−52
f Piscium	5	2.71	14.3	3 1.7	15 16.6	+ 5 44.0	−0.9122	0.5131	0.2054	−12	−87
ν Piscium	4½	2.80	13.8	4 55.4	15 3 54.2	− 5 59.9	−0.4265	0.5138	0.2020	+15	−64
64 Ceti	5½	+2.93	+13.0	+ 8 2.9	19 50.7	+ 9 29.4	−0.7159	0.5156	+0.1949	− 1	−83
ξ^1 Ceti	4½	2.94	13.0	8 19.5	20 42.6	+10 19.8	−0.8525	0.5157	0.1943	−10	−82
ξ^2 Ceti	4½	2.98	12.1	7 57.7	16 4 45.0	− 5 51.6	+1.0920	0.5172	0.1895	+90	+28
B. A. C. 830	6	3.04	11.5	10 16.0	12 16.6	+ 1 26.9	−0.0573	0.5183	0.1840	+35	−38
μ Ceti	4½	3.04	11.3	9 38.6	13 33.4	+ 2 41.5	+0.8670	0.5184	0.1828	+90	+13
Lalande 5725	6	+3.13	+10.2	+12 45.7	17 0 44.2	−10 27.1	−0.6019	0.5216	+0.1734	+ 5	−71
B. A. C. 1272	6	+3.28	+ 6.0	+17 2.5	18 8 6.2	− 4 1.4	−0.4472	0.5313	+0.1380	+13	−56

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

NOVEMBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1888.0. Δα	Δδ	Apparent Declination	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		s	″	° ′	d h m	h m				c	°
δ^1 Tauri	4	+3.28	+ 4.8	+17 16.9	18 15 32.9	+ 3 11.6	+0.2746	0.5335	+0.1280	+54	-13
63 Tauri	6	3.27	4.8	16 30.9	15 48.2	+ 3 26.5	+1.1610	0.5337	0.1276	+90	+43
δ^2 Tauri	5½	3.28	4.7	17 11.1	16 7.5	+ 3 45.2	+0.4564	0.5338	0.1272	+68	- 3
δ^3 Tauri	5	3.29	4.6	17 40.3	16 48.3	+ 4 24.8	+0.0019	0.5338	0.1264	+38	-27
ε Tauri	3½	3.31	4.2	18 56.0	18 19.5	+ 5 53.1	-1.2130	0.5348	0.1244	-43	-71
B. A. C. 1468	6½	+3.30	+ 2.9	+18 31.8	19 3 1.8	- 9 40.8	+0.2593	0.5367	+0.1109	+53	-12
i Tauri	5½	3.29	2.5	18 38.9	5 30.9	- 7 16.4	+0.3982	0.5378	0.1070	+63	- 5
l Tauri	5½	3.32	+ 1.2	20 16.2	13 28.0	+ 0 25.6	-0.6019	0.5405	0.0942	+ 4	-62
ζ Tauri	3½	3.29	- 1.2	21 4.4	20 3 45.7	- 9 44 1	-0 3161	0.5438	0.0703	+20	-40
χ^1 Orionis	4½	3.25	2.6	20 15.2	11 44.0	- 2 1.3	+1.0960	0.5465	0.0560	+90	+45
141 Tauri	6½	+3.27	- 3.3	+22 23.7	15 7.4	+ 1 15.5	-1.0980	0.5465	+0.0499	-32	-68
η Geminorum	3½	3.24	4.4	22 32.2	21 19.5	+ 7 15.5	-0.9835	0.5483	0.0384	-22	-67
μ Geminorum	3	3.20	4.9	22 34.1	21 1 6.2	+10 54.7	-0.8876	0.5496	0.0312	-15	-67
15 Geminorum	6½	3.16	5.0	20 51.4	3 24.1	-10 51.9	+1.0720	0.5492	0.0265	+90	+45
d Geminorum	6	3.09	7.0	21 53.5	14 27.2	- 0 10.7	+0 1085	0.5508	+0.0055	+44	-10
44 Geminorum	6	+3.05	- 8.0	+22 48.1	20 49.0	+ 5 58.3	-0.8991	0.5512	-0.0068	-16	-67
δ Geminorum	3½	2.97	9.0	22 11.1	22 3 41.8	-11 22.5	-0.3114	0.5516	0.0202	+20	-34
63 Geminorum	5½	2.92	9.4	21 40.1	7 14.1	- 6 57.4	+0.1740	0.5525	0.0269	+48	- 8
79 Geminorum	6½	2.82	10.1	20 34.9	15 18.4	- 0 9.2	+1.0820	0.5516	0.0424	+90	+45
μ^2 Cancri	5½	2.71	11.5	21 54.2	23 1 44.2	+ 9 55.7	-0.9109	0.5512	0.0626	-17	-68
B. A. C 2788	6	+2.63	-12.0	+21 5.8	7 34.5	- 8 25.7	-0.4301	0.5511	-0.0737	+13	-47
η Cancri	5½	2.56	12.5	20 49.0	13 19.0	- 2 52 6	-0.5778	0.5507	0.0839	+ 5	-59
35 Cancri	6½	2.53	12.4	19 58.3	14 32.6	- 1 41.5	+0.2387	0.5496	0.0861	+52	-10
39 Cancri	6½	2.51	12.7	20 24.0	16 45.4	+ 0 26.8	-0.4232	0.5501	0.0902	+14	-48
40 Cancri	6½	2.51	12.7	20 21.8	16 47.8	+ 0 29.1	-0.3870	0.5501	0.0904	+16	-46
ε Cancri	6½	+2.51	-12.6	+19 56.4	16 55.3	+ 0 36.4	+0.0615	0.5501	-0.0906	+42	-20
80 Cancri	6½	2.30	13.4	18 30.0	24 7 36.1	- 9 12.0	+0.0969	0.5483	0.1163	+43	-21
83 Cancri	5½	2.25	13.5	18 10.6	10 53.8	- 6 0.8	+0.0555	0.5480	0.1217	+41	-24
8 Leonis	5½	2.13	13.6	16 56.1	19 21.3	+ 2 9.9	+0.2965	0.5474	0.1354	+56	-12
34 Leonis	6½	1.90	13.0	13 54.3	25 11 38.0	- 6 5.4	+1.1200	0.5473	0.1600	+90	+36
37 Leonis	5½	+1.86	-13.2	+14 17.0	14 0.4	- 3 47.7	+0.3321	0.5457	-0.1631	+58	-14
l Leonis	5½	1.65	12.5	11 8.1	26 5 23.5	+11 5.2	+0.9824	0.5445	0.1825	+90	+22
B. A. C. 3837	6½	1.50	11.6	8 40.2	17 5.2	- 1 36.0	+1.3420	0.5450	0.1953	+90	+62
ω Virginis	6	1.38	10.8	8 45.1	27 4 35.0	+ 9 31.2	-1.0500	0.5466	0.2061	-23	-81
ν Virginis	4	1.34	10.8	7 9.2	8 3.5	-11 7.2	-0.1202	0.5490	0.2085	+31	-43
c Virginis	5½	+1.17	- 9.2	+ 3 56.0	28 0 9.1	+ 4 26.5	-0.2601	0.5501	-0.2189	+24	-53
B. A. C. 4254	6	1.10	8.3	+ 2 28.2	8 27.0	-11 32.2	-0.6008	0.5529	0.2223	+ 6	-78
80 Virginis	6	0.90	5.0	- 4 49.6	29 10 10.8	-10 41.2	+0.9734	0.5643	0.2242	+85	+16
88 Virginis	6½	+0.86	- 4.2	- 6 16.8	15 47.4	- 5 16.5	+1.1660	0.5669	-0.2226	+84	+31

DECEMBER.

					NEW MOON.						
μ Sagittarii	4	+0.74	+ 4.6	-21 5.2	4 0 25.8	- 0 45.5	-0.5639	0.6163	-0.0448	-12	-78
15 Sagittarii	5½	+0.74	+ 4.6	-20 45.5	0 58.4	- 0 14.2	-0.9114	0 6163	-0.0434	-33	-90
B. A. C. 6336	6	0.79	5.1	21 29.3	9 23.5	+ 7 49.6	-0.4637	0.6151	0.0204	- 9	-69
B. A. C. 6347	6	0.80	5.1	21 8.4	9 46.0	+ 8 11.2	-0.8156	0.6152	0.0197	+10	-45
28 Sagittarii	5½	0.81	5.1	22 30.4	12 30.8	+10 49.0	+0.4925	0.6145	0.0120	+46	-10
30 Sagittarii	6½	0.82	5.3	22 17.3	14 12.0	-11 34.0	+0.2586	0.6138	0.0076	+30	-23
31 Sagittarii	6½	+0.82	+ 5.3	-22 3.0	14 41.1	-11 6.1	+0.0198	0.6137	-0.0064	+26	-37
33 Sagittarii	6	0.82	5.4	21 29.7	15 23.7	-10 25.3	-0.5346	0.6141	0.0043	-14	-75
ν^1 Sagittarii	5	0.83	5.2	22 52.8	15 25.9	-10 23.2	+0.8366	0.6141	0.0043	+67	+12
ν^2 Sagittarii	5	0.83	5.3	22 48.5	15 47.0	-10 2.9	+0.7638	0.6138	0.0035	+67	+ 7
ξ^2 Sagittarii	3½	0.84	5.4	21 15.0	16 47.7	- 9 4.9	-0.7803	0.6131	-0.0008	-28	-90
o Sagittarii	3½	+0.86	+ 5.5	-21 54.2	19 23.3	- 6 35.8	-0.1256	0.6124	+0.0063	+ 9	-45
π Sagittarii	3	+0.86	+ 5.7	-21 11.9	21 19.0	- 4 44.8	-0.8084	0.6113	+0.0113	-20	-90

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

DECEMBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1888.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	″	° ′	d h m	h m				°	°
50 Sagittarii	6	+0.91	+ 5.9	−21 59.7	5 3 33.7	+ 1 14.4	+0.1046	0.6092	+0.0276	+23	−32
Mars				20 37.2	6 5 14.8	+ 1 53.6	+0.2517	0.5135	−0.0693	+36	−23
19 Capricorni	6	0.98	6.7	18 20.7	14 29.4	+10 46.9	−1.1440	0.5847	+0.1088	−45	−90
20 Capricorni	6½	1.00	6.5	19 28.0	16 27.2	−11 19.6	+0.2157	0.5824	0.1124	+37	−26
30 Capricorni	5½	1.29	8.2	18 27.1	7 0 9.2	− 3 54.9	+0.1023	0.5755	0.1266	+32	−32
31 Capricorni	6½	+1.29	+ 8.3	−17 55.8	0 16.9	− 3 47.5	−0.4163	0.5755	+0.1268	+ 4	−64
ι Capricorni	4½	1.30	8.5	17 18.6	1 58.9	− 2 9.2	−0.8375	0.5744	0.1301	−20	−90
γ Capricorni	3½	1.38	8.7	17 9.9	9 38.9	+ 5 14.2	+0.0584	0.5678	0.1427	+32	−35
δ Capricorni	2½	1.40	8.9	16 38.0	12 41.2	+ 8 10.0	−0.0482	0.5650	0.1472	+27	−41
ι Aquarii	4½	1.49	9.7	14 24.6	21 20.5	− 7 28.8	−1.0280	0.5586	0.1595	−28	−90
39 Aquarii	6½	+1.52	+ 9.7	−14 44.5	8 0 2.9	− 4 52.0	−0.2482	0.5560	+0.1632	+18	−52
45 Aquarii	6½	1.56	10.0	13 51.7	3 3.2	− 1 57.8	−0.6712	0.5534	0.1668	− 5	−88
50 Aquarii	6	1.58	10.0	14 5.7	5 33.0	+ 0 27.0	−0.0087	0.5512	0.1695	+32	−38
B. A. C. 7835	6½	1.61	10.2	13 29.2	8 7.6	+ 2 56.4	−0.2024	0.5494	0.1726	+22	−50
70 Aquarii	6	1.69	11.0	11 8.6	16 49.8	+11 21.5	−1.1260	0.5434	0.1816	−33	−90
74 Aquarii	6	+1.72	+10.7	−12 12.6	19 11.6	−10 21.3	+0.4287	0.5411	+0.1835	+59	−15
ψ^1 Aquarii	4	1.83	11.4	9 41.6	9 6 2.8	+ 0 9.3	−0.1946	0.5337	0.1921	+24	−49
ψ^2 Aquarii	4	1.85	11.3	9 47.5	7 3.3	+ 1 7.8	+0.1045	0.5328	0.1926	+40	−32
ψ^3 Aquarii	4½	1.85	11.2	10 13.2	7 34.4	+ 1 38.0	+0.6602	0.5323	0.1930	+78	− 2
B. A. C. 8274	7	2.01	11.9	6 59.9	22 23.5	− 8 0.2	+0.1503	0.5255	0.2014	+45	−29
30 Piscium	4½	+2.08	+11.8	− 6 38.0	10 5 14.8	− 1 21.1	+1.1470	0.5224	+0.2040	+83	+30
33 Piscium	4½	2.10	11.8	6 19.8	6 59.4	+ 0 20.4	+1.1780	0.5211	0.2043	+84	+33
B. A. C. 17	6	2.13	11.9	5 52.0	9 33.5	+ 2 49.9	+1.2050	0.5202	0.2052	+84	+36
14 Ceti	6	2.28	13.0	1 7.1	22 43.2	− 8 23.4	−1.2190	0.5159	0.2077	−37	−90
15 Ceti	6½	2.30	12.8	− 1 7.1	11 0 3.8	− 7 5.1	−0.9385	0.5152	0.2077	−15	−90
26 Ceti	6	+2.45	+12.7	+ 0 46.2	13 41.8	+ 6 9.3	−0.1694	0.5123	+0.2073	+28	−48
29 Ceti	6½	2.47	12.8	1 24.7	15 55.2	+ 8 19.0	−0.4106	0.5128	0.2072	+16	−63
33 Ceti	6	2.49	12.9	1 51.2	17 17.9	+ 9 39.3	−0.6095	0.5124	0.2072	+ 5	−79
35 Ceti	6½	2.50	12.8	1 53.0	18 21.1	+10 40.7	−0.4252	0.5121	0.2068	+15	−64
f Piscium	5	2.54	13.0	3 1.7	21 9.7	−10 35.5	−1.0960	0.5110	0.2059	−26	−87
ν Piscium	4½	+2.68	+12.6	+ 4 55.4	12 9 48.4	+ 1 41.7	−0.5983	0.5119	+0.2026	+ 6	−77
64 Ceti	5½	2.86	12.0	8 2.9	13 1 48.1	− 6 45.8	−0.8620	0.5125	0.1954	−10	−82
ξ^1 Ceti	4½	2.87	11.9	8 19.5	2 40.2	− 5 55.2	−0.9984	0.5127	0.1949	−19	−82
ξ^2 Ceti	4½	2.94	11.0	7 57.7	10 44.8	+ 1 55.6	+0.9576	0.5139	0.1899	+90	+18
B. A. C. 830	6	3.04	10.7	10 16.0	18 18.6	+ 9 16.4	−0.1774	0.5157	0.1848	+28	−45
μ Ceti	4½	+3.04	+10.5	+ 9 38.6	19 35.8	+10 31.4	+0.7487	0.5164	+0.1836	+90	+ 6
Lalande 5725	6	3.18	9.8	12 45.7	14 6 49.9	− 2 34.0	−0.7000	0.5192	0.1743	− 1	−73
B. A. C. 1272	6	3.50	5.8	17 2.5	15 14 18.2	+ 3 58.1	−0.4908	0.5296	0.1396	+11	−58
δ^1 Tauri	4	3.54	4.7	17 16.9	21 45.3	+11 11.5	+0.2444	0.5323	0.1292	+53	−15
63 Tauri	6	3.53	4.6	16 30.9	22 0.8	+11 26.5	+1.1300	0.5326	0.1289	+90	+40
δ^2 Tauri	5½	+3.54	+ 4.6	+17 11.1	22 20.0	+11 45.2	+0.4260	0.5323	+0.1287	+65	− 6
δ^3 Tauri	5	3.56	4.5	17 40.3	23 0.9	−11 35.2	−0.0259	0.5331	0.1276	+36	−29
B. A. C. 1468	6½	3.63	2.8	18 31.8	16 9 14.0	− 1 41.1	+0.2463	0.5373	0.1128	+53	−13
i Tauri	5½	3.64	2.3	18 38.9	11 43.1	+ 0 43.3	+0.3907	0.5386	0.1089	+63	− 5
l Tauri	5½	3.70	+ 1.0	20 16.2	19 39.4	+ 8 24.5	−0.5971	0.5405	0.0961	+ 4	−62
ζ Tauri	3½	+3.74	− 1.5	+21 4.4	17 9 54.2	− 1 48.2	−0.2884	0.5464	+0.0719	+22	−38
χ^1 Orionis	4½	3.74	3.0	20 15.1	17 50.0	+ 5 52.8	+1.1350	0.5483	0.0577	+90	+48
141 Tauri	6½	3.78	3.6	22 23.7	21 12.5	+ 2 47.5	−1.0530	0.5492	0.0516	−28	−68
η Geminorum	3½	3.77	4.7	22 32.2	18 3 22.4	− 3 22.4	−0.9286	0.5504	0.0398	−16	−67
μ Geminorum	3	3.77	5.5	22 34.1	7 7.7	− 7 7.7	−0.8252	0.5520	0.0326	−11	−67
15 Geminorum	6½	+3.74	− 5.8	+20 51.4	9 24.6	− 9 24.6	+1.1350	0.5526	+0.0282	+90	+52
d Geminorum	6	3.73	7.9	21 53.5	20 23.4	+ 3 36.6	+0.1836	0.5535	+0.0070	+49	− 6
44 Geminorum	6	3.72	9.1	22 48.0	19 2 42.5	−10 20.7	−0.8112	0.5547	−0.0055	−10	−67
δ Geminorum	3½	3.67	10.2	22 11.1	9 32.4	− 3 44.5	−0.2198	0.5550	0.0189	+25	−28
63 Geminorum	5½	3.64	10.9	21 40.1	13 3.3	− 0 20.8	+0.2687	0.5546	0.0259	+55	− 3
79 Geminorum	6½	+3.57	−12.1	+20 34.9	21 4.6	+ 7 24.4	+1.1870	0.5546	−0.0418	+90	+55
84 Geminorum	6½	+3.57	−12.9	+22 37.0	20 0 39.0	+10 51.5	−1.2020	0.5550	−0.0488	−44	−67

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

DECEMBER.

The Star's					At Conjunction in R. A.						Limiting Parallels.	
Name.	Mag.	Red'ns from 1888.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'		N.	S.
		$\Delta\alpha$	$\Delta\delta$									
		s	″	° ′	d h m	h m					°	°
μ^2 Cancri	5½	+3.51	−13.9	+21 54.2	20 7 26.9	− 6 34.2	−0.7978	0.5543	−0.0620		− 9	−68
B. A. C. 2788	6	3.44	14.6	21 5.7	13 15.8	− 0 57.0	−0.3055	0.5538	0.0728		+20	−39
η Cancri	5½	3.39	15.3	20 48.9	18 59.1	+ 4 34.8	−0.4482	0.5529	0.0835		+12	−50
35 Cancri	6½	3.36	15.4	19 58.2	20 12.5	+ 5 45.7	+0.3684	0.5530	0.0858		+61	− 4
39 Cancri	6½	3.34	15.7	20 23.9	22 24.9	+ 7 53.7	−0.2880	0.5520	0.0895		+22	−40
40 Cancri	6½	+3.34	−15.7	+20 21.7	22 27.3	+ 7 56.0	−0.2536	0.5520	−0.0895		+24	−37
ϵ Cancri	6½	3.34	15 7	19 56.3	22 34.9	+ 8 3.5	+0.1958	0.5520	0.0899		+50	−13
80 Cancri	6½	3.16	17.0	18 29.9	21 13 15.5	− 1 45.2	+0.2432	0.5491	0.1157		+53	−13
83 Cancri	5½	3.12	17.1	18 10.5	16 33.5	+ 1 26.3	+0.2014	0.5480	0.1211		+50	−16
8 Leonis	5½	3.01	17.6	16 56.0	22 1 3.0	+ 9 39.0	+0.4524	0.5470	0.1348		+67	− 5
34 Leonis	6½	+2.80	−18.0	+13 54.2	17 27.3	+ 1 31.3	+1.2870	0.5439	−0.1587		+90	+56
37 Leonis	5½	2.75	18.1	14 16.9	19 51.3	+ 3 50.6	+0.4974	0.5438	0.1620		+71	− 5
42 Leonis	6	2.75	18.5	15 32.1	22 18.5	+ 6 13.1	−1.2440	0.5429	0.1652		−44	−74
i Leonis	5½	2.69	18.5	14 42.4	23 3 15.8	+11 0.8	−1.1890	0.5414	0.1713		−37	−75
l Leonis	5½	2.58	17.7	11 8.0	11 28.2	− 5 2.6	+1.1610	0.5415	0.1811		+90	+37
ω Virginis	6	+2.28	−17.2	+ 8 45.0	24 11 10.7	− 6 5.6	−0.9003	0.5395	−0.2035		−12	−81
ν Virginis	4	2.24	16.6	7 9.1	14 44.9	− 2 38.2	+0.0454	0.5399	0.2062		+40	−34
c Virginis	5½	2.06	14.9	3 56.0	25 7 20.3	−10 34.6	−0.1055	0.5416	0.2158		+32	−43
B. A. C. 4254	6	1.97	14.2	+ 2 28.1	15 55.4	− 2 16.1	−0.4561	0.5429	0.2190		+13	−66
80 Virginis	6	1.71	10.2	− 4 49.7	26 18 38.1	− 0 26.0	+1.1200	0.5520	0.2202		+85	+28
88 Virginis	6½	+1.67	− 9.3	− 6 16.9	27 0 28.1	+ 5 12.2	+1.3140	0.5546	−0.2186		+84	+49
ξ^1 Libræ	6	1.44	5.2	11 26.6	28 5 35.9	+ 9 18.9	+0.3651	0.5724	0.1992		+56	−19
ξ^2 Libræ	5½	1.43	5.0	10 57.6	6 37.4	+10 18.2	−0.3212	0.5724	0.1981		+17	−57
17 Libræ	7	1.41	5.0	10 42.3	7 15.8	+10 55.2	−0.7039	0.5729	0.1975		− 5	−90
18 Libræ	6½	1.41	5.1	10 41.9	7 32.3	+11 11.2	−0.7638	0.5733	0.1970		− 8	−90
γ Libræ	4½	+1.33	− 2.8	−14 24.9	22 48.0	+ 1 52.8	+0.0678	0.5837	−0.1778		+35	−34
η Libræ	6	1.31	2.2	15 18.9	29 2 17.3	+ 5 14.2	+0.3505	0.5871	0.1729		+52	−19
θ Libræ	4½	1.29	1.6	16 24.0	6 13.1	+ 9 1.0	+0.7556	0.5893	0.1665		+74	+ 4
49 Libræ	6	1.26	− 1.4	16 12.2	8 52.6	+11 34.4	+0.1238	0.5917	0.1620		+36	−31
χ Ophiuchi	4½	1.21	0.0	18 12.1	19 23.8	− 2 19.2	+0.4967	0.5983	0.1424		+58	−10
24 Scorpii	5½	+1.18	+ 0.4	−17 31.5	30 1 4.8	+ 3 8.1	−0.9491	0.6017	−0.1307		−27	−90
ξ Ophiuchi	5	+1.11	+ 2.2	−20 59.5	16 5.2	− 6 28.2	+0.7506	0.6098	−0.0967		+69	+ 5
				NEW	*MOON.*							

OCCULTATIONS VISIBLE AT WASHINGTON DURING THE YEAR 1888.

Date.	The Star's		IMMERSION.				EMERSION.				Duration of Occultation.
			Washington.		Angle from		Washington.		Angle from		
	Name.	Mag.	Sidereal Time.	Mean Time.	North Point.	Vertex.	Sidereal Time.	Mean Time.	North Point.	Vertex.	
			h m	h m	°	°	h m	h m	°	°	h m
Jan. 1	7 Leonis	6½	13 45	18 59	161	107	14 24	19 38	340	286	0 39
3	B. A. C. 3837	6½	6 41	11 47	66	117	7 30	12 36	333	22	0 49
7	ξ^1 Libræ	6	10 16	15 16	177	222	10 44	15 45	231	275	0 28
	NEW MOON.										
15	ι Aquarii *	4½	3 16	7 36	137	85	4 7	8 27	264	212	0 51
21	μ Ceti	4½	3 28	7 25	53	34	4 55	8 51	257	216	1 26
22	f Tauri	4	2 37	6 30	155	174	Star 5′.8	south of	☽'s	limb.	
23	75 Tauri	6½	8 49	12 37	172	118	Star 4′.0	south of	☽'s	limb.	
25	χ^3 Orionis	6	1 43	5 24	46	102	2 43	6 24	289	343	0 59
25	68 Orionis	6	6 55	10 35	97	70	8 19	12 0	261	210	1 25
31	b Virginis	5½	13 6	16 22	93	70	14 13	17 29	324	286	1 7
Feb. 2	88 Virginis	6½	14 11	17 19	209	201	Star 7′.8	south of	☽'s	limb.	
4	γ Libræ	4½	11 28	14 28	171	224	12 3	15 3	236	287	0 35
	NEW MOON.										
17	ξ^2 Ceti	4½	5 33	7 44	159	113	Star 4′.8	south of	☽'s	limb.	
21	127 Tauri	6½	4 40	6 35	169	197	Star 6′.0	south of	☽'s	limb.	
21	χ^2 Orionis	6	12 0	13 53	2	310	Star 4′.7	north of	☽'s	limb.	
24	θ Cancri	5½	5 11	6 54	89	142	6 29	8 11	283	327	1 18
25	ψ Leonis	6	14 3	15 40	127	73	14 58	16 36	273	220	0 56
Mar. 5	μ Sagittarii †	4	12 53	13 55	159	207	13 26	14 28	224	271	0 33
5	15 Sagittarii	5½	13 16	14 18	63	111	14 8	15 10	319	3	0 51
	NEW MOON.										
26	b Virginis	5½	11 12	10 52	109	122	12 28	12 7	310	299	1 15
29	ξ^1 Libræ	6	12 2	11 30	95	130	13 8	12 36	319	342	1 6
30	49 Libræ	6	15 52	15 16	77	77	17 0	16 23	322	307	1 7
Apr 1	B. A. C. 6098	6	17 24	16 40	8	15	Star 8′.2	north of	☽'s	limb.	
2	33 Sagittarii *	6	13 3	12 15	126	175	13 56	13 7	249	296	0 52
2	ξ^2 Sagittarii	3½	14 53	14 4	37	81	15 29	14 40	336	14	0 36
	NEW MOON.										
12	μ Ceti	4½	8 25	6 59	165	112	Star 2′.5	south of	☽'s	limb.	
14	63 Tauri ‡	6	10 21	8 46	81	29	11 18	9 43	267	218	0 57
15	m Tauri	5½	7 3	5 25	87	42	8 26	6 48	261	207	1 23
16	χ^4 Orionis	5	10 23	8 41	73	17	11 24	9 41	293	238	1 1
19	δ Cancri	4	10 44	8 50	18	332	Star 5′.7	north of	☽'s	limb.	
24	80 Virginis	6	18 17	16 2	48	359	18 43	16 28	353	302	0 26
27	χ Ophiuchi	4½	14 3	11 36	201	231	Star 3′.6	south of	☽'s	limb.	
29	B. A. C. 6336	6	17 19	14 44	5	21	Star 2′.6	north of	☽'s	limb.	
May 3	45 Aquarii	6½	17 12	14 21	348	37	Star 6′.2	north of	☽'s	limb	
	NEW MOON.										
16	θ Cancri	5½	14 2	10 22	195	141	Star 1′.4	south of	☽'s	limb	
19	B. A. C. 3837	6½	15 7	11 14	61	11	15 45	11 52	349	298	0 37
23	ξ^1 Libræ	6	13 45	9 37	47	62	14 11	10 2	8	18	0 25
24	θ Libræ	4½	13 54	9 41	204	229	Star 7′.1	south of	☽'s	limb.	

NOTE. The angles of position are counted from the north point and vertex of the moon's limb, toward the east.
* Whole occultation below the horizon of Washington.
† Immersion below the horizon of Washington.
‡ Emersion below the horizon of Washington.

OCCULTATIONS VISIBLE AT WASHINGTON DURING THE YEAR 1888.

Date.	The Star's		IMMERSION.				EMERSION.				Duration of Occultation.
			Washington.		Angle from		Washington.		Angle from		
	Name.	Mag.	Sidereal Time.	Mean Time.	North Point.	Vertex.	Sidereal Time.	Mean Time.	North Point.	Vertex.	
			h m	h m	°	°	h m	h m	°	°	h m
May 24	49 Libræ	6	17 3	12 50	18	2	Star 5′.7	north of	☽'s	limb.	
27	*o* Sagittarii	3½	14 7	9 42	104	151	15 11	10 46	272	314	1 4
	NEW MOON.										
June 18	80 Virginis	6	15 39	9 48	136	104	16 47	10 56	278	237	1 7
21	χ Ophiuchi	4½	14 34	8 31	182	205	14 59	8 56	221	239	0 25
26	γ Capricorni	3½	18 28	12 5	63	100	19 46	13 23	268	291	1 18
26	δ Capricorni	2½	23 3	16 40	71	53	0 20	17 56	241	208	1 17
27	B. A. C. 7835	6½	17 39	11 12	346	33	Star 6′.5	north of	☽'s	limb.	
July 2	ξ^2 Ceti	4½	20 43	13 56	42	94	21 42	14 54	270	321	0 59
	NEW MOON.										
20	14 Sagittarii	6	19 36	11 38	88	68	20 52	12 54	272	239	1 16
21	*o* Sagittarii †	3½	13 33	5 32	99	149	14 33	6 33	275	320	1 1
23	30 Capricorni	5½	21 14	13 5	85	84	22 33	14 24	235	217	1 19
24	39 Aquarii	6½	22 6	13 53	337	337	Star 4′.5	north of	☽'s	limb.	
26	B. A. C. 8274	7	18 58	10 37	340	29	Star 2′.8	north of	☽'s	limb.	
	NEW MOON.										
Aug. 13	ξ^1 Libræ	6	18 23	8 52	19	33	Star 1′.8	north of	☽'s	limb.	
17	30 Sagittarii	6½	18 45	8 58	131	131	19 48	10 0	228	215	1 2
17	31 Sagittarii	6½	19 24	9 36	76	67	20 44	10 56	277	251	1 20
20	γ Capricorni †	3½	16 1	6 2	77	127	17 4	7 5	265	311	1 4
20	δ Capricorni	2½	20 7	10 8	37	58	21 18	11 18	285	291	1 11
26	μ Ceti	4½	2 11	15 47	76	87	3 39	17 15	225	203	1 28
29	*m* Tauri	5½	0 56	14 20	107	162	1 57	15 21	216	269	1 1
30	χ^1 Orionis	4½	23 38	12 58	347	40	Star 0′.4	north of	☽'s	limb.	
30	χ^2 Orionis	6	23 40	13 0	167	220	Star 2′.0	south of	☽'s	limb.	
Sept. 1	79 Geminorum †	6½	1 25	14 37	39	346	2 5	15 17	315	10	0 40
	NEW MOON.										
17	50 Aquarii	6	23 1	11 11	56	46	0 21	12 31	250	223	1 20
17	B. A. C. 7835	6½	2 37	14 46	70	25	3 38	15 48	243	193	1 1
18	ψ^1 Aquarii	4	0 23	12 29	9	351	1 14	13 19	291	262	0 51
18	ψ^2 Aquarii	4	1 17	13 22	93	64	2 20	14 25	208	169	1 3
27	15 Geminorum	6½	0 32	12 2	80	134	1 36	13 6	259	316	1 4
27	16 Geminorum	6½	1 2	12 32	169	225	Star 3′.0	south of	☽'s	limb.	
28	56 Geminorum	5½	1 53	13 19	165	220	Star 1′.8	south of	☽'s	limb.	
	NEW MOON.										
Oct. 10	14 Sagittarii	6	19 56	6 36	1	337	Star 8′.4	north of	☽'s	limb.	
13	30 Capricorni	5½	0 30	10 57	75	37	1 36	12 3	242	197	1 6
14	39 Aquarii	6½	2 6	12 29	14	330	2 46	13 9	297	250	0 40
15	74 Aquarii	6	19 5	5 25	72	114	20 23	6 43	244	275	1 18
16	B. A. C. 8274	7	0 17	10 33	55	46	1 40	11 56	241	212	1 23
20	μ Ceti †	4½	19 25	5 26	63	111	20 20	6 21	255	306	0 55
	NEW MOON.										

NOTE.—The angles of position are counted from the north point and vertex of the moon's limb, toward the east.

* Whole occultation below the horizon of Washington.

† Immersion below the horizon of Washington.

‡ Emersion below the horizon of Washington.

OCCULTATIONS VISIBLE AT WASHINGTON DURING THE YEAR 1888.

Date.	The Star's		Immersion.				Emersion.				Duration of Occultation.
			Washington.		Angle from		Washington.		Angle from		
	Name.	Mag.	Sidereal Time.	Mean Time.	North Point.	Vertex.	Sidereal Time.	Mean Time.	North Point.	Vertex.	
			h m	h m	°	°	h m	h m	°	°	h m
Nov. 7	ν^1 Sagittarii	5	20 47	5 37	124	99	21 43	6 33	224	189	0 56
7	ν^2 Sagittarii	5	21 13	6 3	113	82	22 15	7 5	234	195	1 2
9	20 Capricorni	6½	0 18	9 0	33	354	1 11	9 53	286	241	0 53
18	δ^2 Tauri	5½	8 56	17 0	101	46	10 0	18 5	243	190	1 5
23	35 Cancri	6½	5 12	12 57	82	137	6 35	14 20	290	337	1 22
23	ε Cancri	6½	9 17	17 2	17	353	Star 0′.9	north of	☽'s	limb.	
25	37 Leonis	5½	4 27	12 5	102	154	5 32	13 9	283	337	1 4
	NEW MOON.										
Dec. 9	ψ^2 Aquarii	4	1 36	8 20	329	296	Star 9′.0	north of	☽'s	limb.	
9	ψ^3 Aquarii	4½	1 2	7 45	81	55	2 13	8 56	219	181	1 11
10	30 Piscium	4½	21 11	3 50	130	167	21 41	4 21	173	205	0 31
13	ξ^2 Ceti	4½	4 24	10 51	154	116	Star 6′.1	south of	☽'s	limb.	
16	i Tauri	5½	6 11	12 26	345	307	Star 5′.7	north of	☽'s	limb.	
24	ν Virginis	4	7 16	12 59	46	356	7 43	13 26	1	49	0 27

NOTE.—The angles of position are counted from the north point and vertex of the moon's limb, toward the east.
* Whole occultation below the horizon of Washington.
† Immersion below the horizon of Washington.
‡ Emersion below the horizon of Washington.

DOWNES'S TABLE GIVING VALUES OF τ.

FOR COMPUTING THE TIME AND HOUR-ANGLE OF APPARENT CONJUNCTION.

h	Lat. 72° x'			Lat. 66° x'			Lat. 60° x'			Lat. 54° x'			Lat. 48° x'			Lat. 42° x'			Lat. 36° x'		
	.62	.56	.50	.62	.56	.50	.62	.56	.50	.62	.56	.50	.62	.56	.50	.62	.56	.50	.62	.56	.50
h m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
0 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	2	2	2	2	2	2	3	3	3	3	4	4	4	4	5	5	5	6	5	6	7
20	3	3	4	4	5	5	5	6	7	6	7	9	8	9	11	9	10	12	11	12	14
30	5	5	6	6	7	8	8	9	11	10	11	13	12	13	16	14	16	18	16	18	22
40	6	7	8	8	9	11	11	12	14	13	15	17	16	18	21	18	21	24	21	24	29
50	7	8	10	10	11	13	13	15	17	16	19	21	19	22	26	22	26	30	26	30	36
1 0	9	10	11	12	14	16	16	18	21	19	22	26	23	26	31	26	31	36	30	35	42
10	10	12	13	14	16	18	18	21	24	22	26	30	26	30	36	31	35	42	35	40	48
20	12	13	15	16	18	21	21	23	27	25	29	34	30	34	40	35	40	47	39	45	54
30	13	15	17	18	20	23	23	26	30	28	32	37	33	38	45	39	44	52	43	50	59
40	14	16	18	20	22	25	25	29	33	31	35	41	36	42	49	42	48	57	47	54	64
50	16	18	20	21	24	28	27	31	36	34	38	44	39	45	53	45	52	61	51	58	68
2 0	17	19	22	23	26	30	29	33	39	36	41	47	42	48	56	48	55	65	54	62	72
10	18	20	23	25	28	32	31	36	41	38	43	50	45	51	59	51	59	68	57	66	76
20	19	22	24	26	30	34	33	38	43	40	46	53	47	54	62	54	62	71	60	69	80
30	20	23	26	28	31	36	35	40	45	42	48	55	50	56	65	57	64	74	63	72	83
40	21	24	27	29	33	37	37	42	47	44	50	58	52	59	68	59	67	77	65	74	86
50	22	25	28	30	34	39	38	43	49	46	52	60	54	61	70	61	69	79	68	76	88
3 0	23	26	30	31	35	40	40	45	51	48	54	62	56	63	72	63	71	81	70	79	90
10	24	27	31	33	36	42	41	46	53	49	56	63	57	65	74	65	73	83	72	81	92
20	25	28	32	34	38	43	42	47	54	51	57	65	59	66	75	66	74	85	73	82	93
30	26	29	33	35	39	44	43	49	55	52	58	66	60	67	77	68	76	86	74	83	95
40	26	29	33	36	40	45	44	50	56	53	59	67	61	69	78	69	77	87	75	84	96
50	27	30	34	36	41	46	45	51	57	54	60	68	62	70	79	70	78	88	76	85	96
4 0	28	31	35	37	41	47	46	52	58	55	61	69	63	70	79	71	79	89	77	86	97
10	28	31	35	38	42	47	47	52	59	56	62	70	64	71	80	71	79	89	78	86	97
20	29	32	36	38	42	48	47	53	59	56	62	70	64	71	80	72	80	89	78	87	97
30	29	32	36	39	43	48	48	53	60	57	63	71	65	72	81	72	80	90	79	87	97
40	29	33	37	39	43	49	48	53	60	57	63	71	65	72	81	72	80	89	79	87	97
50	30	33	37	39	44	49	48	54	60	57	63	71	65	72	81	72	80	89	79	87	96
5 0	30	33	37	39	44	49	49	54	60	57	63	71	65	72	80	72	80	89	78	86	95
10	30	33	37	40	44	49	49	54	60	57	63	71	65	72	80	72	79	88	78	86	95
20	30	33	37	40	44	49	49	54	60	57	63	71	65	71	79	72	79	88	78	85	94
30	30	33	37	40	44	49	49	54	60	57	63	70	64	71	79	71	78	87	77	85	93
40	30	33	37	39	44	49	48	53	59	56	62	70	64	70	78	70	77	86	76	84	91
50	30	33	37	39	43	48	48	53	59	56	61	69	63	70	77	70	77	85	75	83	90
6 0	30	33	37	39	43	48	48	52	58	55	61	68	63	69	76	69	76	84	74	82	89
10	30	33	37	39	43	47	47	52	58	55	60	67	62	68	75	68	75	82	73	80	87
20	29	32	36	38	42	47	47	51	57	54	60	66	61	67	74	67	73	81	72	79	85
30	29	32	36	38	42	46	46	51	56	53	59	65	60	66	73	66	72	80	71	78	84
40	29	32	35	37	41	46	45	50	55	53	58	64	59	65	71	65	71	78	70	76	82
50	28	31	35	37	40	45	45	49	54	52	57	62	58	63	70	63	69	76	68	74	80
7 0	28	31	34	36	40	44	44	48	53	51	55	61	57	62	68	62	68	75	67	73	78
10	27	30	34	35	39	43	43	47	52	50	54	60	56	61	67	61	66	73	65	71	76
20	27	30	33	35	38	42	42	46	51	48	53	58	54	59	65	59	65	71	64	69	74
30	26	29	32	34	37	41	41	45	49	47	52	57	53	58	63	58	63	69	62	67	71
40	26	28	31	33	36	40	40	44	48	46	50	55	51	56	62	56	61	67			
50	25	27	31	32	35	39	39	42	47	45	49	53	50	54	60	54	59	65			
8 0	24	27	30	31	34	38	38	41	45	43	47	52	48	52	58	53	57	63			
10	24	26	29	30	33	37	36	40	44	42	46	50	47	51	56	52	55	60			
20	23	25	28	29	32	35	35	38	42	40	44	48	45	49	54						
30	22	24	27	28	31	34	34	37	41	39	42	46	43	47	52						
40	21	23	26	27	30	33	33	35	39	37	41	44	41	45	49						
50	20	22	25	26	28	31	31	34	37	36	39	42	40	43	47						
9 0	19	21	24	25	27	30	30	32	35	34	37	40									
10	18	20	22	24	26	28	28	31	34	32	35	38									
20	18	19	21	22	24	27	27	29	32	31	33	36									
30	16	18	20	21	23	25	25	27	30	29	31	34									
40	15	17	19	20	22	24	24	26	28	27	29	32									

(Concluded at bottom of next page.)

DOWNES'S TABLE GIVING VALUES OF τ.

FOR COMPUTING THE TIME AND HOUR-ANGLE OF APPARENT CONJUNCTION.

h	Lat. 30°			Lat. 24°			Lat. 18°			Lat. 12°			Lat. 6°			Lat. 0°		
	x'			x'			x'			x'			x'			x'		
	.62	.56	.50	.62	.56	.50	.62	.56	.50	.62	.56	.50	.62	.56	.50	.62	.56	.50
h m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
0 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	6	7	8	7	7	9	7	8	9	7	8	10	7	8	10	8	9	11
20	12	14	16	13	14	18	14	16	19	14	16	20	14	17	21	15	18	21
30	17	20	24	19	22	27	20	24	29	21	25	30	21	25	31	22	26	32
40	23	27	32	25	29	36	26	32	39	28	33	40	28	34	41	29	34	42
50	28	33	40	31	36	44	32	39	48	35	40	50	35	42	51	35	42	52
1 0	33	39	47	36	42	52	38	46	56	40	47	59	41	49	60	41	49	61
10	38	45	54	41	48	59	44	52	63	46	54	67	47	56	68	47	56	69
20	43	50	60	46	54	65	49	58	70	52	60	74	53	62	75	53	63	76
30	48	55	66	51	60	71	54	64	76	57	66	79	58	68	81	59	69	82
40	52	60	71	56	65	77	59	69	82	62	72	84	63	73	87	64	74	88
50	56	64	76	60	69	82	64	74	87	66	77	89	68	78	92	68	79	93
2 0	59	68	80	64	73	86	68	78	91	70	81	95	72	83	97	72	83	98
10	62	72	84	67	77	90	71	81	95	74	85	99	75	87	101	76	87	102
20	65	75	87	70	81	94	74	85	99	77	88	103	78	90	105	79	91	106
30	68	78	90	73	84	97	77	88	102	80	91	106	81	93	108	82	94	109
40	71	81	93	76	87	100	80	91	105	83	94	109	84	96	111	85	97	112
50	74	83	96	78	89	102	82	93	107	85	96	111	87	98	113	87	99	114
3 0	76	85	98	80	91	104	84	95	109	87	98	113	89	100	115	89	101	116
10	77	87	99	82	92	106	86	97	111	89	100	114	91	102	116	91	103	117
20	79	89	101	84	94	107	88	99	112	91	102	115	92	104	118	93	104	118
30	80	90	102	85	95	108	89	100	113	92	103	116	94	105	119	94	105	119
40	81	91	103	86	96	109	90	101	114	93	104	117	95	106	119	95	106	120
50	82	92	104	87	97	110	91	101	114	94	104	118	95	106	120	96	107	120
4 0	83	92	104	88	98	110	92	102	114	94	105	118	96	107	120	97	107	120
10	84	93	104	88	98	110	92	102	114	95	105	118	96	107	120	97	107	120
20	84	93	104	89	98	110	92	102	114	95	105	117	96	107	119	97	107	120
30	84	93	104	89	98	110	92	102	114	95	105	117	96	107	119	97	107	119
40	84	93	104	89	98	109	92	102	113	95	104	116	96	106	118	97	107	119
50	84	93	103	88	97	108	92	101	113	94	104	115	96	106	117	96	106	118
5 0	84	92	102	88	97	108	91	101	112	94	103	114	95	105	116	96	105	117
10	83	92	102	88	96	107	91	100	110	93	102	113	95	104	115	95	104	115
20	83	91	101	87	95	106	90	99	109	92	101	112	94	103	114	94	103	114
30	82	90	100	86	94	104	89	98	108	92	100	111	93	102	112	93	102	113
40	81	89	98	85	93	103	88	97	106	91	99	109	92	100	110			
50	80	88	97	84	92	101	87	95	105	89	97	107						
6 0	79	87	95	83	91	100	86	94	103	88	96	105						
10	78	85	94	82	89	98	84	92	101									
20	77	84	92	80	88	96	82	91	99									
30	75	82	90	79	86	94												
40	74	81	88	77	84	92												
50	72	79	86															
7 0	71	77	84															

(Concluded from preceding page.)

h	Lat. 72°			Lat. 66°			Lat. 60°		
	x'			x'			x'		
	.62	.56	.50	.62	.56	.50	.62	.56	.50
h m	m	m	m	m	m	m	m	m	m
9 50	14	16	18	18	20	22	22	24	26
10 0	13	15	16	17	19	21	20	22	24
10	12	14	15	16	17	19	19	21	22
20	11	12	14	15	16	17	17	19	20
30	10	11	12	13	14	16	16	17	18
40	9	10	11	12	13	14	14	15	16
50	8	9	10	10	11	12	12	13	14

h	Lat. 72°			Lat. 66°			Lat. 60°		
	x'			x'			x'		
	.62	.56	.50	.62	.56	.50	.62	.56	.50
h m	m	m	m	m	m	m	m	m	m
11 0	7	8	8	9	10	11	10	11	12
10	6	6	7	7	8	9	9	9	10
20	5	5	6	6	6	7	7	8	8
30	3	4	4	4	5	5			
40	2	3	3	3	3	4			
50	1	1	1	1	2	2			
12 0	0	0	0	0	0	0			

FOR WASHINGTON MEAN NOON.

Date.	k	i	θ	L	Date.	k	i	θ	L
		°	°				°	°	
Jan. 1	0.965	21.7	174.7	25.3	July 4	0.026	161.6	38.5	4.1
6	0.981	15.9	166.1	24.9	9	0.009	168.9	106.0	1.6
11	0.992	10.2	151.8	25.6	14	0.041	156.5	156.0	6.8
16	0.998	5.2	113.9	27.6	19	0.119	139.6	169.6	18.0
21	0.997	6.6	33.5	31.1	24	0.238	121.6	176.4	32.1
26	0.984	14.5	3.8	36.6	29	0.392	102.5	182.1	46.8
31	0.952	25.4	351.9	44.7	Aug. 3	0.571	81.9	187.9	60.3
Feb. 5	0.882	40.2	344.7	55.3	8	0.752	59.7	194.5	68.7
10	0.756	59.2	339.3	65.8	13	0.891	38.5	202.6	67.9
15	0.562	82.8	334.9	68.2	18	0.975	18.2	215.3	59.9
20	0.331	108.7	330.4	53.3	23	0.998	5.2	279.4	49.4
25	0.122	138.2	322.9	24.1	28	0.988	12.7	3.1	40.7
Mar. 1	0.018	164.5	295.2	3.8	Sept. 2	0.962	22.4	15.4	34.5
6	0.024	162.3	187.7	4.7	7	0.930	30.7	20.4	30.6
11	0.110	141.2	167.4	17.9	12	0.895	37.8	22.9	28.3
16	0.224	123.5	161.6	28.3	17	0.857	44.4	24.3	27.4
21	0.333	109.6	158.4	32.6	22	0.815	51.0	25.0	27.5
26	0.429	98.1	156.0	33.5	27	0.765	57.9	25.3	28.8
31	0.511	88.8	154.2	33.0	Oct. 2	0.706	65.6	25.0	31.2
Apr. 5	0.582	80.5	152.5	32.5	7	0.630	74.9	24.7	34.9
10	0.648	72.8	151.3	32.7	12	0.530	86.5	24.3	38.4
15	0.712	65.0	150.5	33.9	17	0.397	101.9	24.4	40.2
20	0.777	56.4	150.3	36.5	22	0.231	122.6	25.4	27.0
25	0.844	46.5	150.6	41.0	27	0.065	150.4	28.0	13.4
30	0.913	34.4	151.8	47.7	Nov. 1	0.002	174.7	191.2	0.5
May 5	0.972	19.3	154.5	56.4	6	0.126	138.5	206.3	27.4
10	1.000	1.4	175.6	64.6	11	0.360	106.3	206.9	56.5
15	0.972	19.4	339.1	67.9	16	0.579	80.9	206.1	60.6
20	0.884	39.8	344.2	64.0	21	0.736	61.8	204.3	52.1
25	0.765	58.0	349.1	55.8	26	0.838	47.5	201.6	42.3
30	0.642	73.5	354.0	47.5	Dec. 1	0.902	36.5	198.0	35.1
June 4	0.529	86.7	358.5	40.9	6	0.941	28.1	193.4	30.0
9	0.426	98.5	2.6	35.6	11	0.968	20.8	187.6	26.8
14	0.331	109.7	6.4	31.0	16	0.984	14.5	179.4	25.1
19	0.241	121.2	10.1	25.9	21	0.994	9.0	165.8	24.5
24	0.160	133.6	14.3	20.1	26	0.998	4.9	123.6	25.0
29	0.079	147.3	21.2	11.5	31	0.998	5.7	41.8	26.7
34	0.026	161.6	38.5	4.1					

NOTATION.

k, the ratio of the illuminated portion of the apparent disk to the entire apparent disk considered as the superficies of a circle.

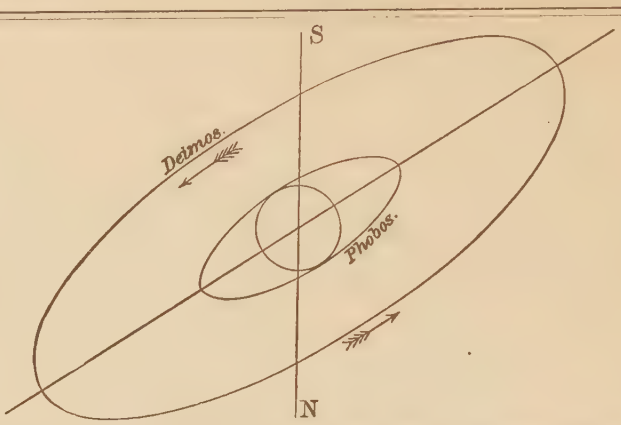
i, the angle between the sun and earth, as seen from the planet.

θ, the angle which the line joining the cusps, or extremities of the illuminated portion, makes with the meridian.

L, the brilliancy of the disk. The unit of L is the amount of light received by an eye from a circular disk with the same albedo as the planet, subtending an angular radius of one second of arc, situated at distance unity from the sun, and illuminated by the latter as the mean disk of the planet is illuminated.

FOR WASHINGTON MEAN NOON.

Date.	k	i	θ	L	Date.	k	i	θ	L
		°	°				°	°	
Jan. 1	0.643	73.4	196.1	110.5	July 4	0.999	2.7	200.4	46.9
6	0.662	71.1	194.0	105.1	9	1.000	0.8	239.2	47.0
11	0.681	68.8	191.7	100.1	14	1.000	1.5	321.9	47.0
16	0.699	66.6	189.3	95.6	19	0.999	3.4	346.7	47.1
21	0.715	64.5	186.7	91.4	24	0.998	5.3	356.3	47.2
26	0.732	62.4	183.9	87.6	29	0.996	7.3	2.0	47.4
31	0.747	60.4	181.1	84.0	Aug. 3	0.994	9.3	6.0	47.6
Feb. 5	0.762	58.4	178.3	80.6	8	0.991	11.2	9.3	47.9
10	0.777	56.4	175.5	77.5	13	0.987	13.1	11.8	48.2
15	0.790	54.5	172.7	74.7	18	0.983	15.0	14.0	48.5
20	0.803	52.6	169.9	72.1	23	0.979	16.9	15.9	48.9
25	0.816	50.8	167.3	69.7	28	0.974	18.8	17.3	49.3
Mar. 1	0.828	48.9	164.8	67.4	Sept. 2	0.968	20.7	18.4	49.8
6	0.840	47.1	162.6	65.3	7	0.962	22.5	19.2	50.3
11	0.851	45.3	160.5	63.4	12	0.956	24.3	19.8	50.9
16	0.862	43.4	158.7	61.7	17	0.949	26.2	20.1	51.6
21	0.873	41.6	157.1	60.1	22	0.942	28.0	20.1	52.3
26	0.883	39.9	155.8	58.6	27	0.934	29.8	19.9	53.1
31	0.892	38.1	154.7	57.3	Oct. 2	0.926	31.6	19.3	53.9
Apr. 5	0.902	36.3	153.9	56.1	7	0.918	33.3	18.5	54.8
10	0.911	34.5	153.3	54.9	12	0.910	35.1	17.4	55.9
15	0.920	32.7	153.0	53.9	17	0.901	36.8	16.1	57.0
20	0.928	30.9	153.0	52.9	22	0.891	38.6	14.5	58.2
25	0.936	29.1	153.2	52.0	27	0.882	40.4	12.7	59.5
30	0.944	27.3	153.7	51.2	Nov. 1	0.871	42.1	10.6	60.9
May 5	0.951	25.5	154.5	50.5	6	0.861	43.9	8.3	62.4
10	0.958	23.7	155.6	49.9	11	0.850	45.6	6.0	64.1
15	0.964	21.8	157.1	49.4	16	0.839	47.4	3.5	65.9
20	0.970	20.0	158.8	48.9	21	0.827	49.2	1.0	67.9
25	0.975	18.1	160.8	48.5	26	0.815	51.0	358.4	70.0
30	0.980	16.2	163.2	48.1	Dec. 1	0.802	52.8	355.8	72.3
June 4	0.984	14.3	165.9	47.8	6	0.789	54.6	353.3	74.7
9	0.988	12.4	168.9	47.5	11	0.776	56.5	351.0	77.4
14	0.991	10.5	172.5	47.3	16	0.762	58.4	348.7	80.3
19	0.994	8.6	176.7	47.1	21	0.747	60.4	346.6	83.5
24	0.997	6.6	182.0	47.0	26	0.732	62.3	344.7	87.0
29	0.998	4.6	188.5	46.9	31	0.716	64.3	342.9	90.7



APPARENT ORBITS OF THE SATELLITES OF MARS IN MARCH AND APRIL, 1888, *AS SEEN IN AN INVERTING TELESCOPE.*

The circle represents the disk of the planet and is on the same scale as the orbits. The mean motions of the satellites are not yet (August, 1884) sufficiently well determined to enable the times of greatest elongation to be very accurately predicted.

WASHINGTON MEAN TIMES OF GREATEST ELONGATION.

PHOBOS.						DEIMOS.					
	d	h		d	h		d	h		d	h
March	20	0.0 E.	April	5	17.7 W.	April	22	11.4 E.	March	17	6.9 W.	April	14	15.8 E.
	21	2.7 W.		6	20.5 E.		23	14.1 W.		19	4.3 E.		16	13.2 W.
	22	5.5 E.		7	23.2 W.		24	16.9 E.		21	1.7 W.		18	10.6 E.
	23	8.3 W.		9	2.0 E.		25	19.7 W.		22	23.1 E.		20	8.0 W.
	24	11.1 E.		10	4.8 W.		26	22.5 E.		24	20.5 W.		22	5.4 E.
	25	13.9 W.		11	7.6 E.		28	1.3 W.		26	17.9 E.		24	2.8 W.
	26	16.7 E.		12	10.4 W.		29	4.1 E.		28	15.3 W.		26	0.2 E.
	27	19.4 W.		13	13.1 E.		30	6.8 W.		30	12.7 E.		27	21.6 W.
	28	22.2 E.		14	15.9 W.	May	1	9.6 E.	April	1	10.1 W.		29	19.0 E.
	30	1.0 W.		15	18.7 E.		2	12.4 W.		3	7.5 E.	May	1	16.4 W.
	31	3.8 E.		16	21.5 W.		3	15.2 E.		5	4.9 W.		3	13.8 E.
April	1	6.6 W.		18	0.2 E.		4	18.0 W.		7	2.3 E.		5	11.2 W.
	2	9.3 E.		19	3.0 W.		5	20.7 E.		8	23.7 W.		7	8.6 E.
	3	12.1 W.		20	5.8 E.		6	23.5 W.		10	21.1 E.		9	6.0 W.
	4	14.9 E.		21	8.6 W.		8	2.3 E.		12	18.4 W.		11	3.4 E.

Date.			Position Angle.	Distance.	Date.			Position Angle.	Distance.
	d	h	°	″		d	h	°	″
March	20	0.0	126.4	19.0	March	17	6.9	305.2	46.7
April	3	12.1	305.6	20.7	April	3	7.5	124.3	51.9
April	22	11.4	123.7	21.1	April	24	2.8	302.2	53.0
May	6	23.5	302.5	20.1	May	11	3.4	120.8	49.1

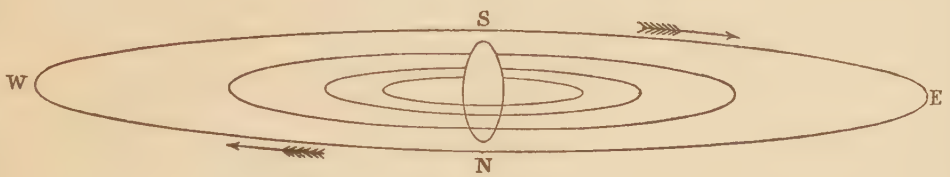
For Phobos every seventh eastern and western elongation is given, and for Deimos every third; the intermediate ones may be found with sufficient accuracy by adding the periodic time of each satellite.

Periodic time of Phobos, $0^d\ 7^h\ 39^m\ 13^s.937$. Periodic time of Deimos, $1^d\ 6^h\ 17^m\ 54^s.377$.

APPARENT DISK OF MARS.

January	31,	0.911	May	30,	0.919	September	28,	0.880
March	1,	0.945	June	29,	0.878	October	28,	0.897
March	31,	0.994	July	29,	0.864	November	26,	0.916
April	30,	0.981	August	28,	0.868	December	26,	0.935

The numbers in this table are the versed sines of the illuminated disk, the apparent diameter of the planet being taken as unity.



APPARENT ORBITS OF THE SATELLITES OF JUPITER IN 1888, *AS SEEN IN AN INVERTING TELESCOPE.*

(*The vertical scale is two and one-half times the horizontal one.*)

The object of this figure is to facilitate the identification of the satellites in cases where the diagrams of configurations do not suffice for that purpose: reference to the above diagram enables one to identify the inner and outer satellite of the pair. The central, vertical ellipse represents the disk of Jupiter, elongated two and one-half times in the vertical direction to correspond to the representation of the orbits of the satellites.

Facing each page of the phenomena of Jupiter's satellites, pages 456—479, is the page of diagrams of configurations, for the same month. The light disks ○ in the vertical row in the middle of the page represent the relative position of Jupiter each day. The dots adjacent in the same horizontal space represent the positions of the several satellites on the same day, at the hour and minute of Washington mean time indicated above the diagrams. The latitudes of the satellites are always considered zero in constructing the diagrams, except where two or more satellites chance to be at nearly the same distance from the planet, when they are placed one above the other according to their apparent latitudes. The numerals designating the satellites are placed on the right or left hand side of the dot, according as the motion of the satellite, for the time of the configuration, is toward the east or toward the west—the motion being always toward the numeral. Frequently, at the epoch of the configuration, one or more satellites will be invisible, being projected on the disk of the planet: this phenomenon is indicated by a light disk ○ at the left hand side of the page. Frequently, also, one or more satellites will be invisible, being concealed in occultation behind the disk, or eclipsed in the shadow of the planet: this phenomenon is indicated by a dark disk ● at the right hand side of the page. In both cases, the annexed numeral serves to point out which satellite is thus rendered invisible.

When an observation is made at a different hour from that for which the diagram is constructed, the motion of the satellite during the interval may be judged by transferring its given position to the above diagram, and estimating its motion during the elapsed interval on the above diagram of the orbits, by means of the following table of the periods:—

MEAN SYNODIC PERIODS OF THE SATELLITES.

	d	h	m	s		d
I.	1	18	28	35.945	=	1.76986048
II.	3	13	17	53.735	=	3.55409416
III.	7	3	59	35.854	=	7.16638720
IV.	16	18	5	6.928	=	16.75355241

WASHINGTON MEAN TIMES OF SUPERIOR GEOCENTRIC CONJUNCTION.

SATELLITE I.

		h m			h m			h m			h m
Jan.	1	3 13.3	March	22	13 15.7	June	11	21 26.8	Sept.	1	6 39.5
	2	21 43.2		24	7 43.0		13	15 53.1		3	1 8.7
	4	16 13.0		26	2 10.3		15	10 19.4		4	19 37.9
	6	10 42.7		27	20 37.4		17	4 45.7		6	14 7.2
	8	5 12.4		29	15 4.6		18	23 12.1		8	8 36.5
	9	23 42.1		31	9 31.7		20	17 38.6		10	3 5.8
	11	18 11.8	April	2	3 58.7		22	12 5.1		11	21 35.2
	13	12 41.3		3	22 25.5		24	6 31.7		13	16 4.6
	15	7 10.9		5	16 52.5		26	0 58.3		15	10 34.1
	17	1 40.4		7	11 19.2		27	19 24.9		17	5 3.6
	18	20 10.0		9	5 45.9		29	13 51.8		18	23 33.2
	20	14 39.3		11	0 12.6	July	1	8 18.6		20	18 2.9
	22	9 8.8		12	18 39.2		3	2 45.5		22	12 32.4
	24	3 38.2		14	13 5.8		4	21 12.6		24	7 2.0
	25	22 7.6		16	7 32.3		6	15 39.5		26	1 31.7
	27	16 36.8		18	1 58.7		8	10 6.6		27	20 1.5
	29	11 6.0		19	20 25.1		10	4 33.7		29	14 31.3
	31	5 35.1		21	14 51.4		11	23 0.9	Oct.	1	9 1.2
Feb.	2	0 4.3		23	9 17.7		13	17 28.2		3	3 31.1
	3	18 33.3		25	3 44.0		15	11 55.6		4	22 0.9
	5	13 2.4		26	22 10.2		17	6 23.0		6	16 30.8
	7	7 31.3		28	16 36.3		19	0 50.5		8	11 0.8
	9	2 0.3		30	11 2.5		20	19 18.1		10	5 30.7
	10	20 29.1	May	2	5 28.6		22	13 45.8		12	0 0.7
	12	14 57.9		3	23 54.7		24	8 13.4		13	18 30.6
	14	9 26.6		5	18 20.8		26	2 41.2		15	13 0.7
	16	3 55.3		7	12 46.8		27	21 9.1		17	7 30.7
	17	22 23.9		9	7 12.7		29	15 37.0		19	2 0.9
	19	16 52.5		11	1 38.7		31	10 4.9		20	20 31.0
	21	11 21.0		12	20 4.6	Aug.	2	4 33.0		22	15 1.2
	23	5 49.5		14	14 30.5		3	23 1.1		24	9 31.3
	25	0 17.8		16	8 56.4		5	17 29.3		26	4 1.5
	26	18 46.1		18	3 22.3		7	11 57.6		27	22 31.7
	28	13 14.3		19	21 48.3		9	6 25.8		29	17 2.0
March	1	7 42.6		21	16 14.3		11	0 54.2		31	11 32.2
	3	2 10.7		23	10 40.2		12	19 22.7	Nov.	2	6 2.4
	4	20 38.8		25	5 6.2		14	13 51.3		4	0 32.7
	6	15 6.8		26	23 32.2		16	8 19.9		5	19 3.1
	8	9 34.8		28	17 58.1		18	2 48.5		7	13 33.4
	10	4 2.6		30	12 24.0		19	21 17.2		9	8 3.7
	11	22 30.4	June	1	6 50.0		21	15 46.0		11	2 34.0
	13	16 58.0		3	1 16.0		23	10 14.9		12	21 4.4
	15	11 25.8		4	19 42.2		25	4 43.8		14	15 34.8
	17	5 53.3		6	14 8.3		26	23 12.7		16	10 5.1
	19	0 20.8		8	8 34.5		28	17 41.5			
	20	18 48.3		10	3 0.7		30	12 10.5			

WASHINGTON MEAN TIMES OF SUPERIOR GEOCENTRIC CONJUNCTION.

SATELLITE II.

		h m			h m			h m			h m
Jan.	2	0 42.7	March	23	18 34.5	June	13	8 58.7	Sept.	3	1 41.0
	5	14 4.6		27	7 46.9		16	22 8.1		6	15 1.5
	9	3 26.2		30	20 58.9		20	11 17.1		10	4 23.5
	12	16 47.6	April	3	10 10.3		24	0 27.5		13	17 44.8
	16	6 8.7		6	23 21.3		27	13 37.5		17	7 7.4
	19	19 29.4		10	12 31.7	July	1	2 48.9		20	20 29.4
	23	8 49.9		14	1 41.8		4	15 59.9		24	9 52.7
	26	22 9.9		17	14 51.2		8	5 12.4		27	23 15.4
	30	11 29.7		21	4 0.5		11	18 24.4	Oct.	1	12 39.2
Feb.	3	0 49.0		24	17 9.1		15	7 38.0		5	2 2.4
	6	14 8.0		28	6 17.8		18	20 51.2		8	15 26.8
	10	3 26.6	May	1	19 25.7		22	10 6.0		12	4 50.5
	13	16 44.8		5	8 33.8		25	23 20.3		15	18 15.3
	17	6 2.6		8	21 41.2		29	12 36.4		19	7 39.4
	20	19 20.0		12	10 49.1	Aug.	2	1 51.9		22	21 4.4
	24	8 36.9		15	23 56.3		5	15 9.1		26	10 28.8
	27	21 53.3		19	13 4.0		9	4 25.8		29	23 54.1
March	2	11 9.3		23	2 11.1		12	17 44.1	Nov.	2	13 18.7
	6	0 24.8		26	15 18.9		16	7 1.8		6	2 44.2
	9	13 39.7		30	4 26.1		19	20 21.2		9	16 9.1
	13	2 54.1	June	2	17 34.2		23	9 39.9		13	5 34.5
	16	16 8.1		6	6 41.8		26	23 0.2		16	18 59.5
	20	5 21.5		9	19 50.5		30	12 19.8		20	8 25.0

SATELLITE III.

		h m			h m			h m			h m
Jan.	5	15 24.6	March	31	15 25.8	June	25	7 49.2	Sept.	19	6 11.8
	12	19 42.9	April	7	18 59.2	July	2	11 17.7		26	10 27.3
	19	23 59.1		14	22 28.8		9	14 50.7	Oct.	3	14 44.9
	27	4 12.2		22	1 54.1		16	18 28.3		10	19 4.9
Feb.	3	8 22.2		29	5 16.1		23	22 10.2		17	23 27.4
	10	12 29.3	May	6	8 35.3		31	1 56.0		25	3 51.5
	17	16 33.0		13	11 52.5	Aug.	7	5 46.4	Nov.	1	8 17.4
	24	20 33.0		20	15 9.2		14	9 40.9		8	12 44.1
March	3	0 28.6		27	18 25.9		21	13 39.5		15	17 11.6
	10	4 19.9	June	3	21 44.1		28	17 42.4		22	21 39.8
	17	8 6.3		11	1 3.3	Sept.	4	21 48.8			
	24	11 48.2		18	4 24.9		12	1 59.0			

SATELLITE IV.

		h m			h m			h m			h m
Jan.	10	13 30.2	April	3	7 23.2	June	25	8 43.3	Sept.	16	23 11.1
	27	8 59.6		19	22 44.1	July	12	0 14.7	Oct.	3	18 45.2
Feb.	13	3 51.3	May	6	13 22.6		28	16 40.4		20	14 47.2
	29	21 56.3		23	3 38.5	Aug.	14	10 1.9	Nov.	6	11 10.2
March	17	15 8.1	June	8	17 57.1		31	4 14.2		23	7 47.4

WASHINGTON MEAN TIME.

JANUARY.

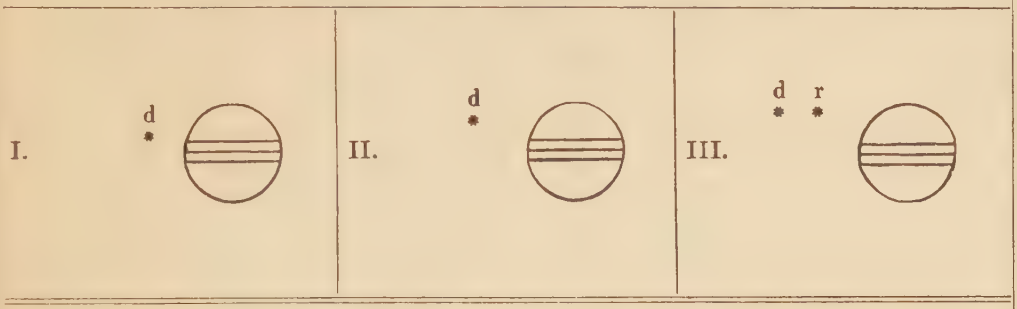
d	h	m	s				d	h	m	s				d	h	m	s			
1	1	18	43.1	I.	Ec.	Dis.	10	22	3		I.	Tr.	Eg.	21	11	55		I.	Sh.	Eg.
	4	20		I.	Oc.	Re.		23	21		II.	Tr.	Eg.		12	59		I.	Tr.	Eg.
	20	43		III.	Sh.	In.	11	16	9	18.4	I.	* Ec.	Dis.		12	59		II.	Tr.	In.
	21	49	25.4	II.	Ec.	Dis.		19	18		I.	Oc.	Re.		13	21		II.	Sh.	Eg.
	22	29		III.	Sh.	Eg.	12	13	21		I.	Sh.	In.		15	28		II.	Tr.	Eg.
	22	31		I.	Sh.	In.		13	38	58.5	II.	Ec.	Dis.	22	6	59	43.4	I.	Ec.	Dis.
	23	23		I.	Tr.	In.		14	20		I.	Tr.	In.		10	15		I.	Oc.	Re.
2	0	9		III.	Tr.	In.		14	57	46.8	III.	Ec.	Dis.	23	4	10		I.	Sh.	In.
	0	44		I.	Sh.	Eg.		15	33		I.	Sh.	Eg.		5	16		I.	Tr.	In.
	1	35		I.	Tr.	Eg.		16	28	0.2	III.	* Ec.	Re.		5	28	23.4	II.	Ec.	Dis.
	1	58		II.	Oc.	Re.		16	32		I.	* Tr.	Eg.		6	23		I.	Sh.	Eg.
	1	59		III.	Tr.	Eg.		18	2		II.	* Oc.	Re.		7	28		I.	Tr.	Eg.
	19	47	7.2	I.	Ec.	Dis.		18	50		III.	Oc.	Dis.		8	35		III.	Sh.	In.
	22	49		I.	Oc.	Re.		20	36		III.	Oc.	Re.		10	4		II.	Oc.	Re.
3	16	21		II.	Sh.	In.	13	10	37	38.5	I.	Ec.	Dis.		10	21		III.	Sh.	Eg.
	16	59		I.	* Sh.	In.		13	47		I.	Oc.	Re.		13	3		III.	Tr.	In.
	17	53		I.	* Tr.	In.	14	7	49		I.	Sh.	In.		14	46		III.	Tr.	Eg.
	18	5		II.	* Tr.	In.		8	15		II.	Sh.	In.	24	1	28	4.4	I.	Ec.	Dis.
	18	51		II.	Sh.	Eg.		8	49		I.	Tr.	In.		4	44		I.	Oc.	Re.
	19	12		I.	Sh.	Eg.		10	1		I.	Sh.	Eg.		22	38		I.	Sh.	In.
	20	5		I.	Tr.	Eg.		10	14		II.	Tr.	In.		23	45		I.	Tr.	In.
	20	35		II.	Tr.	Eg.		10	45		II.	Sh.	Eg.	25	0	9		II.	Sh.	In.
4	14	15	36 4	I.	Ec.	Dis.		11	1		I.	Tr.	Eg.		0	51		I.	Sh.	Eg.
	17	19		I.	* Oc.	Re.		12	43		II.	Tr.	Eg.		1	58		I.	Tr.	Eg.
5	10	59	59.2	III.	Ec.	Dis.	15	5	6	6.5	I.	Ec.	Dis.		2	21		II.	Tr.	In.
	11	5	58.4	II.	Ec.	Dis.		8	17		I.	Oc.	Re.		2	39		II.	Sh.	Eg.
	11	27		I.	Sh.	In.	16	2	17		I.	Sh.	In.		4	50		II.	Tr.	Eg.
	12	22		I.	Tr.	In.		2	55	27.7	II.	Ec.	Dis.		19	56	31.9	I.	Ec.	Dis.
	12	30	0.8	III.	Ec.	Re.		3	19		I.	Tr.	In.		23	14		I.	Oc.	Re.
	13	40		I.	Sh.	Eg.		4	29		I.	Sh.	Eg.	26	17	6		I.	* Sh.	In.
	14	30		III.	Oc.	Dis.		4	38		III.	Sh.	In.		18	14		I.	* Tr.	In.
	14	34		I.	Tr.	Eg.		5	31		I.	Tr.	Eg.		18	44	49.9	II.	Ec.	Dis.
	15	20		II.	Oc.	Dis.		6	23		III.	Sh.	Eg.		19	19		I.	Sh.	Eg.
	16	19		III.	Oc.	Re.		7	23		II.	Oc.	Re.		20	27		I.	Tr.	Eg.
6	8	43	57.6	I.	Ec.	Dis.		8	47		III.	Tr.	In.		22	52	50.4	III.	Ec.	Dis.
	11	49		I.	Oc.	Re.		10	32		III.	Tr.	Eg.		23	24		II.	Oc.	Re.
7	5	39		II.	Sh.	In.		23	34	28.6	I.	Ec.	Dis.	27	0	23	36.6	III.	Ec.	Re.
	5	56		I.	Sh.	In.	17	2	46		I.	Oc.	Re.		3	21		III.	Oc.	Dis.
	6	52		I.	Tr.	In.		20	45		I.	Sh.	In.		5	3		III.	Oc.	Re.
	7	28		II.	Tr.	In.		21	33		II.	Sh.	In.		14	24	50.9	I.	Ec.	Dis.
	8	9		II.	Sh.	Eg.		21	48		I.	Tr.	In.		17	43		I.	* Oc.	Re.
	8	9		I.	Sh.	Eg.		22	58		I.	Sh.	Eg.	28	11	35		I.	Sh.	In.
	9	4		I.	Tr.	Eg.		23	37		II.	Tr.	In.		12	43		I.	Tr.	In.
	9	58		II.	Tr.	Eg.	18	0	0		I.	Tr.	Eg.		13	27		II.	Sh.	In.
8	3	12	26.6	I.	Ec.	Dis.		0	3		II.	Sh.	Eg.		13	47		I.	Sh.	Eg.
	6	19		I.	Oc.	Re.		2	6		II.	Tr.	Eg.		14	56		I.	Tr.	Eg.
9	0	22	29.0	II.	Ec.	Dis.		18	2	56.4	I.	* Ec.	Dis.		15	43		II.	* Tr.	In.
	0	24		I.	Sh.	In.		21	16		I.	Oc.	Re.		15	57		II.	* Sh.	Eg.
	0	40		III.	Sh.	In.	19	15	13		I.	Sh.	In.		18	11		II.	* Tr.	Eg.
	1	21		I.	Tr.	In.		16	11	55.4	II.	* Ec.	Dis.	29	8	53	17.1	I.	Ec.	Dis.
	2	26		III.	Sh.	Eg.		16	17		I.	* Tr.	In.		12	12		I.	Oc.	Re.
	2	37		I.	Sh.	Eg.		17	26		I.	* Sh.	Eg.	30	6	3		I.	Sh.	In.
	3	32		I.	Tr.	Eg.		18	29		I.	Tr.	Eg.		7	12		I.	Tr.	In.
	4	29		III.	Tr.	In.		18	55	32.6	III.	Ec.	Dis.		8	1	17.6	II.	Ec.	Dis.
	4	41		II.	Oc.	Re.		20	26	1.2	III.	Ec.	Re.		8	15		I.	Sh.	Eg.
	6	16		III.	Tr.	Eg.		20	44		II.	Oc.	Re.		9	25		I.	Tr.	Eg.
	21	40	49.6	I.	Ec.	Dis.		23	7		III.	Oc.	Dis.		12	33		III.	Sh.	In.
10	0	48		I.	Oc.	Re.	20	0	51		III.	Oc.	Re.		12	44		II.	Oc.	Re.
	18	52		I.	Sh.	In.		12	31	16.1	I.	Ec.	Dis.		14	19		III.	Sh.	Eg.
	18	57		II.	Sh.	In.		15	45		I.	* Oc.	Re.		17	16		III.	* Tr.	In.
	19	51		I.	Tr.	In.	21	9	41		I.	Sh.	In.		18	57		III.	Tr.	Eg.
	20	51		II.	Tr.	In.		10	47		I.	Tr.	In.	31	3	21	37.9	I.	Ec.	Dis.
	21	5		I.	Sh.	Eg.		10	51		II.	Sh.	In.		6	41		I.	Oc.	Re.
	21	27		II.	Sh.	Eg.														

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

JANUARY.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 17h 0m for an Inverting Telescope.

Day.	West.	East.
1	·2	1· 3· 4·
2	3· 4· ·1	·2
3	3· 4·	1· 2·
4	4· ·3 ·2	·1 ●
5	4· 1·	·2 ·3 ●
6	·4	·1 2· ·3
7	·4 1· 2·	3·
8	·4 ·2	1· 3·
9	·4 3· ·1	·2
10	3·	·4 1· 2·
11	·3 2·	·4 ·1 ●
12	1·	3 ·4 ·2 ●
13		·1 2· ·3 ·4
14	1· 2·	3· ·4
15	·2	·1 3· 4·
16	·1 3·	·2 4·
17	3·	1· 2· 4·
18	·3 2· ·1	4·
19	1· 4· ·3	·2 ●
20	4·	·1 3 2·
21	4· 1· 2·	·3
22	4· ·2	·1 3·
23	·4 ·1 3·	·2
24	·4 3·	1· 2·
25	·4 ·3 2· ·1	
26	4 3 2	1·
27		·4 ·3 ·2 ·1 ●
28	2· 1·	·4 ·3
29	·2	·1 3· ·4
30	3· 1·	·2 ·4
31	3·	1· 2· 4·

WASHINGTON MEAN TIME.

FEBRUARY.

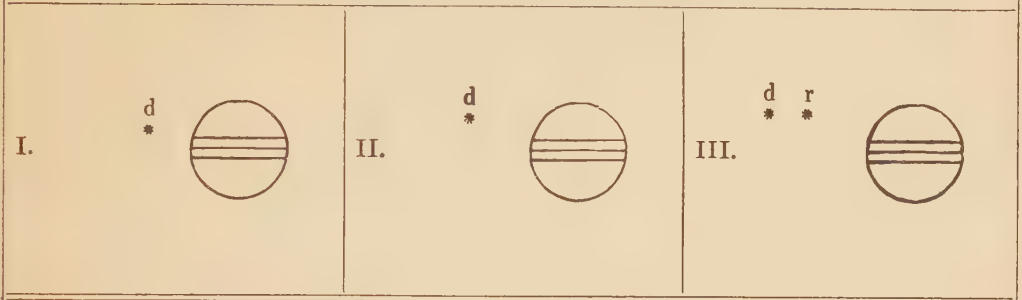
d	h	m	s			d	h	m	s			d	h	m	s		
1	0	31		I.	Sh. In.	10	11	40		III.	Oc. Dis.	20	15	9		I.	* Tr. Eg.
	1	41		I.	Tr. In.		13	18		III.	Oc. Re.		15	40	5.9	II.	* Ec. Dis.
	2	43		I.	Sh. Eg.		18	11	52.5	I.	Ec. Dis.		20	33		II.	Oc. Re.
	2	45		II.	Sh. In.		21	35		I.	Oc. Re.	21	0	24		III.	Sh. In.
	3	54		I.	Tr. Eg.	11	15	20		I.	* Sh. In.		2	11		III.	Sh. Eg.
	5	4		II.	Tr. In.		16	35		I.	* Tr. In.		5	32		III.	Tr. In.
	5	15		II.	Sh. Eg.		17	32		I.	* Sh. Eg.		7	8		III.	Tr. Eg.
	7	32		II.	Tr. Eg.		18	39		II.	Sh. In.		9	2	4.4	I.	Ec. Dis.
	21	50	4.5	I.	Ec. Dis.		18	47		I.	Tr. Eg.		12	27		I.	Oc. Re.
2	1	10		I.	Oc. Re.		21	5		II.	Tr. In.	22	6	9		I.	Sh. In.
	19	0		I.	Sh. In.		21	9		II.	Sh. Eg.		7	26		I.	Tr. In.
	20	10		I.	Tr. In.		23	32		II.	Tr. Eg.		8	22		I.	Sh. Eg.
	21	12		I.	Sh. Eg.	12	12	40	17.6	I.	Ec. Dis.		9	37		I.	Tr. Eg.
	21	17	43.6	II.	Ec. Dis.		16	4		I.	* Oc. Re.		10	32		II.	Sh. In.
	22	23		I.	Tr. Eg.	13	9	49		I.	Sh. In.		13	2		II.	Sh. Eg.
3	2	3		II.	Oc. Re.		11	3		I.	Tr. In.		13	2		II.	Tr. In.
	2	50	4.3	III.	Ec. Dis.		12	1		I.	Sh. Eg.		15	29		II.	* Tr. Eg.
	4	21	10.5	III.	Ec. Re.		13	7	7.4	II.	Ec. Dis.	23	3	30	29.6	I.	Ec. Dis.
	7	32		III.	Oc. Dis.		13	15		I.	Tr. Eg.		6	55		I.	Oc. Re.
	9	12		III.	Oc. Re.		17	58		II.	* Oc. Re.	24	0	38		I.	Sh. In.
	16	18	22.9	I.	* Ec. Dis.		20	27		III.	Sh. In.		1	54		I.	Tr. In.
	19	39		I.	Oc. Re.		22	14		III.	Sh. Eg.		2	51		I.	Sh. Eg.
4	13	28		I.	Sh. In.	14	1	31		III.	Tr. In.		4	5		I.	Tr. Eg.
	14	39		I.	Tr. In.		3	8		III.	Tr. Eg.		4	56	35.9	II.	Ec. Dis.
	15	40		I.	* Sh. Eg.		7	8	37.5	I.	Ec. Dis.		9	50		II.	Oc. Re.
	16	3		II.	* Sh. In.		10	33		I.	Oc. Re.		14	43	9.2	III.	* Ec. Dis.
	16	52		I.	* Tr. Eg.	15	4	17		I.	Sh. In.		16	15	29.0	III.	* Ec. Re.
	18	25		II.	Tr. In.		5	32		I.	Tr. In.		19	45		III.	Oc. Dis.
	18	33		II.	Sh. Eg.		6	29		I.	Sh. Eg.		21	21		III.	Oc. Re.
	20	53		II.	Tr. Eg.		7	44		I.	Tr. Eg.		21	58	47.0	I.	Ec. Dis.
5	10	46	48.5	I.	Ec. Dis.		7	56		II.	Sh. In.	25	1	24		I.	Oc. Re.
	14	8		I.	Oc. Re.		10	24		II.	Tr. In.		19	6		I.	Sh. In.
6	7	56		I.	Sh. In.		10	26		II.	Sh. Eg.		20	22		I.	Tr. In.
	9	8		I.	Tr. In.		12	51		II.	Tr. Eg.		21	19		I.	Sh. Eg.
	10	8		I.	Sh. Eg.	16	1	37	3.1	I.	Ec. Dis.		22	34		I.	Tr. Eg.
	10	34	11.6	II.	Ec. Dis.		5	1		I.	Oc. Re.		23	50		II.	Sh. In.
	11	21		I.	Tr. Eg.		22	45		I.	Sh. In.	26	2	20		II.	Sh. Eg.
	15	22		II.	* Oc. Re.	17	0	0		I.	Tr. In.		2	20		II.	Tr. In.
	16	30		III.	* Sh. In.		0	57		I.	Sh. Eg.		4	47		II.	Tr. Eg.
	18	16		III.	Sh. Eg.		2	12		I.	Tr. Eg.		16	27	11.1	I.	* Ec. Dis.
	21	25		III.	Tr. In.		2	23	35.6	II.	Ec. Dis.		19	52		I.	Oc. Re.
	23	4		III.	Tr. Eg.		7	16		II.	Oc. Re.	27	13	34		I.	Sh. In.
7	5	15	8.9	I.	Ec. Dis.		10	45	5.7	III.	Ec. Dis.		14	50		I.	* Tr. In.
	8	37		I.	Oc. Re.		12	16	58.7	III.	Ec. Re.		15	47		I.	* Sh. Eg.
8	2	24		I.	Sh. In.		15	44		III.	* Oc. Dis.		17	2		I.	* Tr. Eg.
	3	37		I.	Tr. In.		17	21		III.	* Oc. Re.		18	13	8.0	II.	Ec. Dis.
	4	36		I.	Sh. Eg.		20	5	20.6	I.	Ec. Dis.		23	7		II.	Oc. Re.
	5	21		II.	Sh. In.		23	30		I.	Oc. Re.	28	4	21		III.	Sh. In.
	5	49		I.	Tr. Eg.	18	17	13		I.	* Sh. In.		6	9		III.	Sh. Eg.
	7	45		II.	Tr. In.		18	29		I.	Tr. In.		9	30		III.	Tr. In.
	7	51		II.	Sh. Eg.		19	26		I.	Sh. Eg.		10	55	30.3	I.	Ec. Dis.
	10	13		II.	Tr. Eg.		20	40		I.	Tr. Eg.		11	5		III.	Tr. Eg.
	23	43	34.7	I.	Ec. Dis.		21	14		II.	Sh. In.		14	20		I.	* Oc. Re.
9	3	6		I.	Oc. Re.		23	43		II.	Tr. In.	29	8	3		I.	Sh. In.
	20	52		I.	Sh. In.		23	44		II.	Sh. Eg.		9	18		I.	Tr. In.
	22	6		I.	Tr. In.	19	2	10		II.	Tr. Eg.		10	15		I.	Sh. Eg.
	23	4		I.	Sh. Eg.		14	33	44.9	I.	* Ec. Dis.		11	30		I.	Tr. Eg.
	23	50	38.4	II.	Ec. Dis.		17	59		I.	* Oc. Re.		13	7		II.	Sh. In.
10	0	18		I.	Tr. Eg.	20	11	41		I.	Sh. In.		15	37		II.	* Sh. Eg.
	4	40		II.	Oc. Re.		12	57		I.	Tr. In.		15	37		II.	* Tr. In.
	6	47	36.6	III.	Ec. Dis.		13	54		I.	Sh. Eg.		18	4		II.	Tr. Eg.
	8	19	5.0	III.	Ec. Re.												

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

FEBRUARY.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 16h 0m for an Inverting Telescope.

Day.	West.	East.
1	·3 2· ·1	4·
2	·3 ·2	1· 4·
3	·1	·3 ·2 4·
4	1·	2· ·3
5	2· 4·	·1 3·
6	4· 1·	·2 3·
7	4· 3·	·1 2·
8	4· 3· 1· 2·	
9	·4 ·3 ·2	1·
10	·4 ·1	·3 ·2
11	·4 1	· 2· ·3
12	2· ·4	3· ·1 ●
13	1·	4· 3· ·2 ●
14	3·	·1 2· ·4
15	3· 1· 2·	·4
16	·3 ·2	1· ·4
17	·1	·2 4· ·3 ●
18		1· 2· ·3 4·
19	2·	3· 4· ·1 ●
20	2· 1·	3· 4·
21	3· 4·	·1 ·2
22	3· 4· 1· 2·	
23	4· ·3 ·2	·1
24	4· ·1 ·3	·2
25	4·	1· 2· ·3
26	·4 2· ·1	3·
27	1· ·4 ·2	3·
28	·4 3·	·1 ·2
29	2· 3· 1· ·4	

WASHINGTON MEAN TIME.

MARCH.

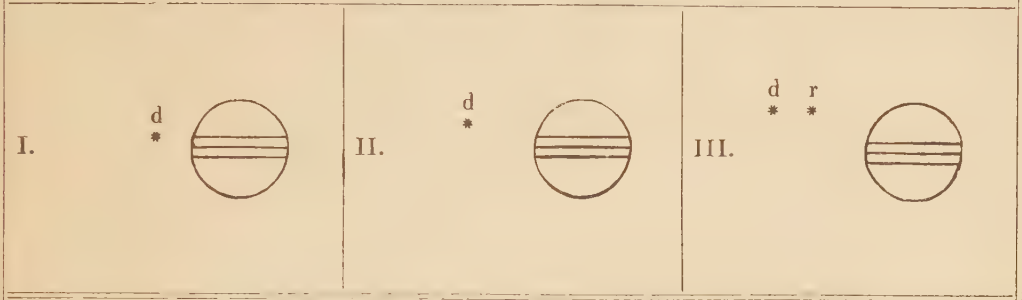
d	h	m	s			d	h	m	s			d	h	m	s		
1	5	23	55.4	I.	Ec. Dis.	11	7	31		II.	Sh. Eg.	21	17	2		I. *	Tr. Eg.
	8	48		I.	Oc. Re.		9	52		II.	Tr. Eg.		20	53		II.	Sh. In.
2	2	31		I.	Sh. In.		20	14	2.3	I.	Ec. Dis.		23	10		II.	Tr. In.
	3	46		I.	Tr. In.		23	36		I.	Oc. Re.		23	23		II.	Sh. Eg.
	4	43		I.	Sh. Eg.	12	17	20		I. *	Sh. In.	22	1	36		II.	Tr. Eg.
	5	58		I.	Tr. Eg.		18	33		I.	Tr. In.		11	4	12.9	I.	Ec. Dis.
	7	29	41.3	II.	Ec. Dis.		19	33		I.	Sh. Eg.		14	21		I. *	Oc. Re.
	12	23		II.	Oc. Re.		20	45		I.	Tr. Eg.	23	8	10		I.	Sh. In.
	18	40	35.8	III.	Ec. Dis.		23	19	31.5	II.	Ec. Dis.		9	18		I.	Tr. In.
	20	13	24.2	III.	Ec. Re.	13	4	7		II.	Oc. Re.		10	22		I.	Sh. Eg.
	23	42		III.	Oc. Dis.		12	15		III.	Sh. In.		11	30		I.	Tr. Eg.
	23	52	12.8	I.	Ec. Dis.		14	4		III. *	Sh. Eg.		15	9	45.1	II. *	Ec. Dis.
3	1	15		III.	Oc. Re.		14	42	21.3	I. *	Ec. Dis.		19	47		II.	Oc. Re.
	3	17		I.	Oc. Re.		17	14		III. *	Tr. In.	24	5	32	31.4	I.	Ec. Dis.
	20	59		I.	Sh. In.		18	4		I.	Oc. Re.		6	32	14.5	III.	Ec. Dis.
	22	14		I.	Tr. In.		18	45		III.	Tr. Eg.		8	6	43.1	III.	Ec. Re.
	23	11		I.	Sh. Eg.	14	11	48		I.	Sh. In.		8	49		I.	Oc. Re.
4	0	26		I.	Tr. Eg.		13	1		I. *	Tr. In.		11	4		III.	Oc. Dis.
	2	25		II.	Sh. In.		14	1		I. *	Sh. Eg.		12	33		III. *	Oc. Re.
	4	54		II.	Tr. In.		15	13		I. *	Tr. Eg.	25	2	38		I.	Sh. In.
	4	55		II.	Sh. Eg.		18	18		II.	Sh. In.		3	45		I.	Tr. In.
	7	21		II.	Tr. Eg.		20	41		II.	Tr. In.		4	50		I.	Sh. Eg.
	18	20	36.7	I.	Ec. Dis.		20	48		II.	Sh. Eg.		5	57		I.	Tr. Eg.
	21	45		I.	Oc. Re.		23	7		II.	Tr. Eg.		10	11		II.	Sh. In.
5	15	28		I. *	Sh. In.	15	9	10	46.5	I.	Ec. Dis.		12	23		II. *	Tr. In.
	16	42		I. *	Tr. In.		12	32		I. *	Oc. Re.		12	41		II. *	Sh. Eg.
	17	40		I.	Sh. Eg.	16	6	17		I.	Sh. In.		14	49		II. *	Tr. Eg.
	18	54		I.	Tr. Eg.		7	28		I.	Tr. In.	26	0	0	55.4	I.	Ec. Dis.
	20	46	16.1	II.	Ec. Dis.		8	30		I.	Sh. Eg.		3	16		I.	Oc. Re.
6	1	38		II.	Oc. Re.		9	40		I.	Tr. Eg.		21	7		I.	Sh. In.
	8	18		III.	Sh. In.		12	36	14.6	II. *	Ec. Dis.		22	12		I.	Tr. In.
	10	6		III.	Sh. Eg.		17	21		II. *	Oc. Re.		23	19		I.	Sh. Eg.
	12	48	55.8	I.	Ec. Dis.	17	2	35	8.5	III.	Ec. Dis.	27	0	24		I.	Tr. Eg.
	13	24		III. *	Tr. In.		3	39	4.4	I.	Ec. Dis.		4	26	30.7	II.	Ec. Dis.
	14	57		III. *	Tr. Eg.		4	9	1.5	III.	Ec. Re.		9	0		II.	Oc. Re.
	16	13		I. *	Oc. Re.		6	59		I.	Oc. Re.		18	29	15.6	I.	Ec. Dis.
7	9	56		I.	Sh. In.		7	21		III.	Oc. Dis.		20	10		III.	Sh. In.
	11	10		I.	Tr. In.		8	51		III.	Oc. Re.		21	43		I.	Oc. Re.
	12	8		I.	Sh. Eg.	18	0	45		I.	Sh. In.		22	0		III.	Sh. Eg.
	13	22		I. *	Tr. Eg.		1	56		I.	Tr. In.	28	0	39		III.	Tr. In.
	15	43		II. *	Sh. In.		2	58		I.	Sh. Eg.		2	8		III.	Tr. Eg.
	18	10		II.	Tr. In.		4	8		I.	Tr. Eg.		15	35		I. *	Sh. In.
	18	13		II.	Sh. Eg.		7	36		II.	Sh. In.		16	39		I. *	Tr. In.
	20	37		II.	Tr. Eg.		9	56		II.	Tr. In.		17	47		I.	Sh. Eg.
8	7	17	20.6	I.	Ec. Dis.		10	6		II.	Sh. Eg.		18	51		I.	Tr. Eg.
	10	41		I.	Oc. Re.		12	22		II.	Tr. Eg.		23	28		II.	Sh. In.
9	4	24		I.	Sh. In.		22	7	28.3	I.	Ec. Dis.	29	1	36		II.	Tr. In.
	5	38		I.	Tr. In.	19	1	27		I.	Oc. Re.		1	58		II.	Sh. Eg.
	6	36		I.	Sh. Eg.		19	13		I.	Sh. In.		4	2		II.	Tr. Eg.
	7	49		I.	Tr. Eg.		20	23		I.	Tr. In.		12	57	41.4	I. *	Ec. Dis.
	10	2	53.8	II.	Ec. Dis.		21	26		I.	Sh. Eg.		16	10		I. *	Oc. Re.
	14	53		II. *	Oc. Re.		22	35		I.	Tr. Eg.	30	10	3		I.	Sh. In.
	22	38	3.7	III.	Ec. Dis.	20	1	52	55.9	II.	Ec. Dis.		11	6		I.	Tr. In.
10	0	11	23.1	III.	Ec. Re.		6	34		II.	Oc. Re.		12	15		I. *	Sh. Eg.
	1	45	38.3	I.	Ec. Dis.		16	13		III. *	Sh. In.		13	18		I. *	Tr. Eg.
	3	34		III.	Oc. Dis.		16	35	47.7	I. *	Ec. Dis.		17	43	26.8	II.	Ec. Dis.
	5	6		III.	Oc. Re.		18	2		III.	Sh. Eg.		22	12		II.	Oc. Re.
	5	9		I.	Oc. Re.		19	54		I.	Oc. Re.	31	7	26	0.2	I.	Ec. Dis.
	22	52		I.	Sh. In.		20	59		III.	Tr. In.		10	29	45.9	III.	Ec. Dis.
11	0	5		I.	Tr. In.		22	29		III.	Tr. Eg.		10	37		I.	Oc. Re.
	1	5		I.	Sh. Eg.	21	13	42		I. *	Sh. In.		12	4	51.9	III. *	Ec. Re.
	2	17		I.	Tr. Eg.		14	50		I. *	Tr. In.		14	42		III. *	Oc. Dis.
	5	1		II.	Sh. In.		15	54		I. *	Sh. Eg.		16	10		III. *	Oc. Re.
	7	26		II.	Tr. In.												

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

MARCH.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 15h 0m for an Inverting Telescope.

Day.	West.	East.
1	·3 ·2	○ ·1 ·4
2	1· ·3	○ ·2 ·4
3		○ 1· 3/2· ·4
4	2· ·1	○ ·3 ·4
5	·2	○ 1· 3· 4·
6	○ 3·	○ ·2 4· ·1 ●
7	3· 1·	○ 2· 4·
8	·3 2·	○ ·1 ·4
9	3 1· 4·	○ ·2
10	4·	○ 1· ·3 ·2
11	4· ·1/2·	○ ·3
12	4· ·2	○ 1· 3·
13	·4	○ 3· ·2 ·1 ●
14	○ 1· ·4 3·	○ 2·
15	·4 ·3 2·	○ ·1
16	4/3 1·	○ ·2 ●
17	·4	○ ·3 ·1 2·
18	·1 2·	○ ·4 ·3
19	·2	○ 1· 3· ·4
20	·1	○ 3 ·2 ·4
21	○ 1· 3·	○ 2· ·4
22	3· 2·	○ ·1 4·
23	·3 1· ·2	○ 4·
24		○ ·3 ·1 ·2 4·
25	1· 2·	○ 4· ·3
26	·2 4·	○ 1· 3·
27	4· ·1	○ 2/3·
28	4· 3·	○ 1· 2·
29	4· 3· 2·	○ ·1 ●
30	·4 ·3 ·2 1·	○
31	·4	○ ·1 ·2 ·3 ●

WASHINGTON MEAN TIME.

APRIL.

d	h	m	s			d	h	m	s			d	h	m	s		
1	4	32		I.	Sh. In.	11	4	5		III.	Sh. In.	21	1	25	49.6	II.	Ec. Dis.
	5	33		I.	Tr. In.		5	56		III.	Sh. Eg.		5	13		II.	Oc. Re.
	6	44		I.	Sh. Eg.		7	47		III.	Tr. In.		13	6	43.6	I. *	Ec. Dis.
	7	45		I.	Tr. Eg.		9	14		III.	Tr. Eg.		15	57		I. *	Oc. Re.
	12	46		II. *	Sh. In.		19	22		I.	Sh. In.		22	23	7.8	III.	Ec. Dis.
	14	48		II. *	Tr. In.		20	14		I.	Tr. In.	22	0	0	17.4	III.	Ec. Re.
	15	16		II. *	Sh. Eg.		21	34		I.	Sh. Eg.		1	11		III.	Oc. Dis.
	17	14		II.	Tr. Eg.		22	25		I.	Tr. Eg.		2	37		III.	Oc. Re.
2	1	54	24.6	I.	Ec. Dis.	12	4	38		II.	Sh. In.		10	12		I. *	Sh. In.
	5	4		I.	Oc. Re.		6	22		II.	Tr. In.		10	53		I. *	Tr. In.
	23	0		I.	Sh. In.		7	8		II.	Sh. Eg.		12	25		I. *	Sh. Eg.
3	0	0		I.	Tr. In.		8	47		II.	Tr. Eg.		13	4		I. *	Tr. Eg.
	1	12		I.	Sh. Eg.		16	44	44.7	I. *	Ec. Dis.		20	31		II.	Sh. In.
	2	12		I.	Tr. Eg.		19	45		I.	Oc. Re.		21	51		II.	Tr. In.
	7	0	16.6	II.	Ec. Dis.	13	13	50		I. *	Sh. In.		23	1		II.	Sh. Eg.
	11	23		II. *	Oc. Re.		14	41		I. *	Tr. In.	23	0	16		II.	Tr. Eg.
	20	22	45.1	I.	Ec. Dis.		16	3		I. *	Sh. Eg.		7	35	10.2	I.	Ec. Dis.
	23	31		I.	Oc. Re.		16	52		I.	Tr. Eg.		10	23		I. *	Oc. Re.
4	0	8		III.	Sh. In.		22	51	27.6	II.	Ec. Dis.	24	4	40		I.	Sh. In.
	1	58		III.	Sh. Eg.	14	2	54		II.	Oc. Re.		5	19		I.	Tr. In.
	4	15		III.	Tr. In.		11	13	5.5	I. *	Ec. Dis.		6	53		I.	Sh. Eg.
	5	43		III.	Tr. Eg.		14	12		I. *	Oc. Re.		7	30		I.	Tr. Eg.
	17	28		I.	Sh. In.		18	25	29.0	III.	Ec. Dis.		14	42	55.4	II. *	Ec. Dis.
	18	27		I.	Tr. In.		20	1	55.4	III.	Ec. Re.		18	22		II.	Oc. Re.
	19	40		I.	Sh. Eg.		21	46		III.	Oc. Dis.	25	2	3	33.8	I.	Ec. Dis.
	20	39		I.	Tr. Eg.		23	12		III.	Oc. Re.		4	50		I.	Oc. Re.
5	2	3		II.	Sh. In.	15	8	18		I.	Sh. In.		12	0		III. *	Sh. In.
	4	0		II.	Tr. In.		9	8		I.	Tr. In.		13	52		III. *	Sh. Eg.
	4	33		II.	Sh. Eg.		10	31		I.	Sh. Eg.		14	38		III. *	Tr. In.
	6	26		II.	Tr. Eg.		11	19		I. *	Tr. Eg.		16	3		III. *	Tr. Eg.
	14	51	11.5	I. *	Ec. Dis.		17	56		II.	Sh. In.		23	8		I.	Sh. In.
	17	58		I.	Oc. Re.		19	32		II.	Tr. In.		23	45		I.	Tr. In.
6	11	57		I. *	Sh. In.		20	26		II.	Sh. Eg.	26	1	21		I.	Sh. Eg.
	12	54		I. *	Tr. In.		21	57		II.	Tr. Eg.		1	56		I.	Tr. Eg.
	14	9		I. *	Sh. Eg.	16	5	41	31.3	I.	Ec. Dis.		9	48		II.	Sh. In.
	15	5		I. *	Tr. Eg.		8	38		I.	Oc. Re.		11	0		II. *	Tr. In.
	20	17	20.5	II.	Ec. Dis.	17	2	47		I.	Sh. In.		12	18		II. *	Sh. Eg.
7	0	34		II.	Oc. Re.		3	34		I.	Tr. In.		13	25		II. *	Tr. Eg.
	9	19	31.4	I.	Ec. Dis.		5	0		I.	Sh. Eg.		20	32	2.8	I.	Ec. Dis.
	12	25		I. *	Oc. Re.		5	45		I.	Tr. Eg.		23	16		I.	Oc. Re.
	14	27	17.8	III. *	Ec. Dis.		12	8	27.9	II. *	Ec. Dis.	27	17	37		I.	Sh. In.
	16	3	3.0	III. *	Ec. Re.		16	4		II. *	Oc. Re.		18	11		I.	Tr. In.
	18	15		III.	Oc. Dis.	18	0	9	53.5	I.	Ec. Dis.		19	50		I.	Sh. Eg.
	19	43		III.	Oc. Re.		3	4		I.	Oc. Re.		20	22		I.	Tr. Eg.
8	6	25		I.	Sh. In.		8	2		III.	Sh. In.	28	4	0	26.3	II.	Ec. Dis.
	7	21		I.	Tr. In.		9	54		III.	Sh. Eg.		7	30		II.	Oc. Re.
	8	37		I.	Sh. Eg.		11	14		III. *	Tr. In.		15	0	26.3	I. *	Ec. Dis.
	9	32		I.	Tr. Eg.		12	40		III. *	Tr. Eg.		17	42		I.	Oc. Re.
	15	21		II. *	Sh. In.		21	15		I.	Sh. In.	29	2	20	52.0	III.	Ec. Dis.
	17	11		II.	Tr. In.		22	1		I.	Tr. In.		3	58	46.6	III.	Ec. Re.
	17	51		II.	Sh. Eg.		23	28		I.	Sh. Eg.		4	33		III.	Oc. Dis.
	19	37		II.	Tr. Eg.	19	0	12		I.	Tr. Eg.		5	59		III.	Oc. Re.
9	3	47	56.2	I.	Ec. Dis.		7	13		II.	Sh. In.		12	5		I. *	Sh. In.
	6	52		I.	Oc. Re.		8	42		II.	Tr. In.		12	38		I. *	Tr. In.
10	0	53		I.	Sh. In.		9	43		II.	Sh. Eg.		14	18		I. *	Sh. Eg.
	1	48		I.	Tr. In.		11	7		II. *	Tr. Eg.		14	49		I. *	Tr. Eg.
	3	6		I.	Sh. Eg.		18	38	21.6	I.	Ec. Dis.		23	6		II.	Sh. In.
	3	59		I.	Tr. Eg.		21	31		I.	Oc. Re.	30	0	8		II.	Tr. In.
	9	34	15.3	II.	Ec. Dis.	20	15	43		I. *	Sh. In.		1	36		II.	Sh. Eg.
	13	44		II. *	Oc. Re.		16	27		I. *	Tr. In.		2	33		II.	Tr. Eg.
	22	16	17.7	I.	Ec. Dis.		17	56		I.	Sh. Eg.		9	28	53.7	I. *	Ec. Dis.
11	1	18		I.	Oc. Re.		18	38		I.	Tr. Eg.		12	8		I. *	Oc. Re.

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re, reappearance; Ec., eclipse.
Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

APRIL.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

I.

II.

III.

Configurations at $13^h\ 30^m$ *for an Inverting Telescope.*

Day.	West.	East.
1	·4 1· 2○· ·3	
2	·2 ·4 ○ ·1 3·	
3	·1 ○ ·2 ·4 3·	
4	3· ○ 1· 2· ·4	
5	3· 2· ·1 ○ ·4	
6	○ 1· ·3 ·2 ○ ·4	
7	·3 ○ ·1 ·2 4·	
8	1· ○ 2· ·3 4·	
9	2· ○ ·1 ·3 4·	
10	1· ○ 3· 4· ·2 ●	
11	3· 4○· 1· 2·	
12	3· 4· 2· ·1 ○	
13	4· ·3 ·2 ○ 1·	
14	4· ·3 ○ ·2 ·1 ●	
15	4· 1· ○ 2· ·3	
16	·4 2· ○ ·1 ·3	
17	·4 1· ○ 3· ·2 ●	
18	·4 3· ○ 1· 2·	
19	3· ·1 ·4 2· ○	
20	·3 ·2 ○ 1· ·4	
21	·3 ○ ·2 ·4 ·1 ●	
22	1· ○ 2· ·3 ·4	
23	2· ○ ·1 ·3 ·4	
24	1· ·2 ○ 3· 4·	
25	3○· ·1 ·2 4·	
26	3· ·1 2· ○ 4·	
27	·3 ·2 ○ 1· 4·	
28	·3 ·1 4· ○ ·2	
29	○ 1· 4· ○ ·3 2·	
30	4· 2· ○ ·1 ·3	

WASHINGTON MEAN TIME.

MAY.

d	h	m	s				d	h	m	s				d	h	m	s			
1	6	34		I.	Sh.	In.	11	0	19	39.4	I.	Ec.	Dis.	21	15	8		I.	* Oc.	Dis.
	7	4		I.	Tr.	In.		2	44		I.	Oc.	Re.		17	20		I.	Oc.	Re.
	8	47		I.	Sh.	Eg.		21	25		I.	Sh.	In.	22	12	15		I.	* Tr.	In.
	9	15		I.	Tr.	Eg.		21	40		I.	Tr.	In.		12	16		I.	* Sh.	In.
	17	17	38.2	II.	Ec.	Dis.		23	38		I.	Sh.	Eg.		14	27		I.	* Tr.	Eg.
	20	38		II.	Oc.	Re.		23	51		I.	Tr.	Eg.		14	29		I.	* Sh.	Eg.
2	3	57	18.3	I.	Ec.	Dis.	12	9	10	28.4	II.	* Ec.	Dis.	23	0	58		II.	Oc.	Dis.
	6	34		I.	Oc.	Re.		12	2		II.	* Oc.	Re.		3	28	3.1	II.	Ec.	Re.
	15	58		III.	* Sh.	In.		18	48	5.6	I.	Ec.	Dis.		9	34		I.	* Oc.	Dis.
	17	50		III.	Sh.	Eg.		21	10		I.	Oc.	Re.		11	46	57.9	I.	* Ec.	Re.
	17	58		III.	Tr.	In.	13	10	15	55.6	III.	* Ec.	Dis.	24	3	48		III.	Tr.	In.
	19	24		III.	Tr.	Eg.		12	37		III.	* Oc.	Re.		3	54		III.	Sh.	In.
3	1	2		I.	Sh.	In.		15	53		I.	* Sh.	In.		5	21		III.	Tr.	Eg.
	1	30		I.	Tr.	In.		16	6		I.	Tr.	In.		5	48		III.	Sh.	Eg.
	3	15		I.	Sh.	Eg.		18	6		I.	Sh.	Eg.		6	41		I.	Tr.	In.
	3	41		I.	Tr.	Eg.		18	17		I.	Tr.	Eg.		6	45		I.	Sh.	In.
	12	23		II.	* Sh.	In.	14	4	15		II.	Sh.	In.		8	53		I.	* Tr.	Eg.
	13	16		II.	* Tr.	In.		4	38		II.	Tr.	In.		8	57		I.	* Sh.	Eg.
	14	53		II.	* Sh.	Eg.		6	45		II.	Sh.	Eg.		19	58		II.	Tr.	In.
	15	41		II.	* Tr.	Eg.		7	4		II.	Tr.	Eg.		20	6		II.	Sh.	In.
	22	25	48.6	I.	Ec.	Dis.		13	16	35.6	I.	* Ec.	Dis.		22	25		II.	Tr.	Eg.
4	1	0		I.	Oc.	Re.		15	36		I.	* Oc.	Re.		22	37		II.	Sh.	Eg.
	19	31		I.	Sh.	In.	15	10	22		I.	* Sh.	In.	25	4	0		I.	Oc.	Dis.
	19	56		I.	Tr.	In.		10	32		I.	* Tr.	In.		6	15	31.8	I.	Ec.	Re.
	21	44		I.	Sh.	Eg.		12	35		I.	* Sh.	Eg.	26	1	7		I.	Tr.	In.
	22	7		I.	Tr.	Eg.		12	43		I.	* Tr.	Eg.		1	13		I.	Sh.	In.
5	6	35	19.4	II.	Ec.	Dis.		22	27	52.0	II.	Ec.	Dis.		3	19		I.	Tr.	Eg.
	9	46		II.	* Oc.	Re.	16	1	9		II.	Oc.	Re.		3	26		I.	Sh.	Eg.
	16	54	13.2	I.	Ec.	Dis.		7	45	3.3	I.	Ec.	Dis.		14	5		II.	* Oc.	Dis.
	19	26		I.	Oc.	Re.		10	2		I.	* Oc.	Re.		16	46	19.0	II.	Ec.	Re.
6	6	18	20.0	III.	Ec.	Dis.		23	55		III.	Sh.	In.		22	26		I.	Oc.	Dis
	9	19		III.	* Oc.	Re.	17	0	33		III.	Tr.	In.	27	0	44	1.4	I.	Ec.	Re.
	13	59		I.	* Sh.	In.		1	49		III.	Sh.	Eg.		17	39		III.	Oc.	Dis.
	14	22		I.	* Tr.	In.		2	3		III.	Tr.	Eg.		19	33		I.	Tr.	In.
	16	12		I.	* Sh.	Eg.		4	50		I.	Sh.	In.		19	42		I.	Sh.	In.
	16	33		I.	Tr.	Eg.		4	58		I.	Tr.	In.		19	53	22.0	III.	Ec.	Re.
7	1	40		II.	Sh.	In.		7	3		I.	Sh.	Eg.		21	45		I.	Tr.	Eg.
	2	24		II.	Tr.	In.		7	9		I.	Tr.	Eg.		21	54		I.	Sh.	Eg.
	4	10		II.	Sh.	Eg.		17	32		II.	Sh.	In.	28	9	5		II.	* Tr.	In.
	4	49		II.	Tr.	Eg.		17	45		II.	Tr.	In.		9	24		II.	* Sh.	In.
	11	22	41.9	I.	* Ec.	Dis.		20	2		II.	Sh.	Eg.		11	32		II.	* Tr.	Eg.
	13	52		I.	* Oc.	Re.		20	11		II.	Tr.	Eg.		11	55		II.	* Sh.	Eg.
8	8	28		I.	Sh.	In.	18	2	13	35.8	I.	Ec.	Dis.		16	52		I.	Oc.	Dis
	8	48		I.	Tr.	In.		4	28		I.	Oc.	Re.		19	12	34.0	I.	Ec.	Re.
	10	41		I.	* Sh.	Eg.		23	19		I.	Sh.	In.	29	13	59		I.	* Tr.	In.
	10	59		I.	* Tr.	Eg.		23	23		I.	Tr.	In.		14	11		I.	* Sh.	In.
	19	52	36.9	II.	Ec.	Dis.	19	1	32		I.	Sh.	Eg.		16	11		I.	Tr.	Eg.
	22	54		II.	Oc.	Re.		1	35		I.	Tr.	Eg.		16	23		I.	Sh.	Eg.
9	5	51	8.0	I.	Ec.	Dis.		11	45	53.7	II.	* Ec.	Dis.	30	3	12		II.	Oc.	Dis.
	8	18		I.	Oc.	Re.		14	17		II.	* Oc.	Re.		6	3	58.7	II.	Ec.	Re.
	19	57		III.	Sh.	In.		20	42	3.6	I.	Ec.	Dis.		11	18		I.	* Oc.	Dis.
	21	17		III.	Tr.	In.		22	54		I.	Oc.	Re.		13	41	4.5	I.	* Ec.	Re.
	21	50		III.	Sh.	Eg.	20	14	14	1.8	III.	* Ec.	Dis.	31	7	4		III.	Tr.	In.
	22	45		III.	Tr.	Eg.		15	55		III.	Oc.	Re.		7	51		III.	Sh.	In.
10	2	56		I.	Sh.	In.		17	47		I.	Sh.	In.		8	25		I.	* Tr.	In.
	3	14		I.	Tr.	In.		17	49		I.	Tr.	In.		8	39		I.	* Sh.	In.
	5	9		I.	Sh.	Eg.		20	0		I.	Sh.	Eg.		8	39		III.	* Tr.	Eg.
	5	25		I.	Tr.	Eg.		20	1		I.	Tr.	Eg.		9	46		III.	* Sh.	Eg.
	14	57		II.	* Sh.	In.	21	6	49		II.	Sh.	In.		10	37		I.	* Tr.	Eg.
	15	31		II.	* Tr.	In.		6	52		II.	Tr.	In.		10	51		I.	* Sh.	Eg.
	17	27		II.	Sh.	Eg.		9	18		II.	* Tr.	Eg.		22	12		II.	Tr.	In.
	17	57		II.	Tr.	Eg.		9	20		II.	* Sh.	Eg.		22	41		II.	Sh.	In.

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

MAY.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

I.

II.

III.

Configurations at 12h 0m for an Inverting Telescope.

Day.	West.	East.
1	4· 2 1·	3·
2	·4	3· ·1 ·2
3	·4 3· 1· 2	·
4	·4 3· ·2	1·
5	4 3 ·1	·2
6	·4	3 1· 2·
7	2·	·4 ·3 ·1 ●
8	·2 1·	3· ·4
9		1 3· ·2 ·4
10	3· 1·	2· ·4
11	3· 2·	·1 4·
12	·3 ·1	4· ·2 ●
13		1· 2· 4· ·3 ●
14	2· ·1	4· ·3
15	1· 2 4·	3·
16	4·	·1 3· 2
17	4· 3· 1·	2·
18	4· 3· 2·	·1
19	·4 ·3 ·1	·2 ●
20	·4	· 3 1· 2·
21	·4 1 2·	·3
22	·2 ·4 1	· 3·
23		·1 ·4 ·2 3·
24	1 3·	2· ·4
25	3· 2·	·1 ·4
26	·3 1· ·2	·4
27	·3	1· ·2 ·4
28	·1 2·	·3 4·
29	·2	1· ·3 4·
30		·2 4· 3 ·1 ●
31	1 3 4	2·

WASHINGTON MEAN TIME.

JUNE.

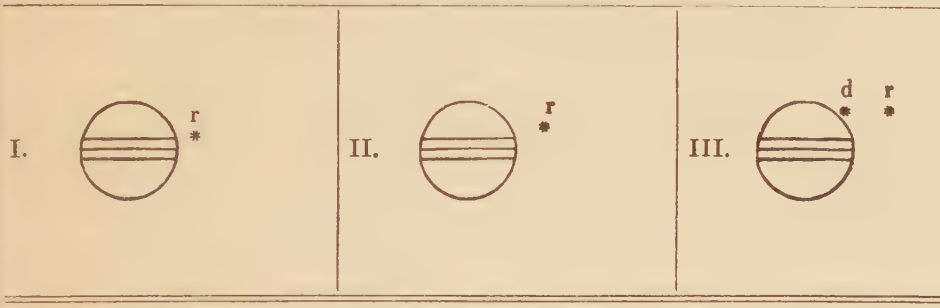
d	h	m	s		d	h	m	s		d	h	m	s	
1	0	39		II. Tr. Eg.	11	3	52	18.0	III. Ec. Re.	21	15	54		I. Tr. Eg.
	1	12		II. Sh. Eg.		13	34		II. * Tr. In.		16	35		I. Sh. Eg.
	5	44		I. Oc. Dis.		14	34		II. * Sh. In.		17	1		III. Tr. In.
	8	9	39.6	I. * Ec. Re.		16	2		II. Tr. Eg.		18	47		III. Tr. Eg.
2	2	51		I. Tr. In.		17	4		II. Sh. Eg.		19	47		III. Sh. In.
	3	8		I. Sh. In.		20	21		I. Oc. Dis.		21	45		III. Sh. Eg.
	5	3		I. Tr. Eg.		23	1	0.5	I. Ec. Re.	22	4	58		II. Tr. In.
	5	20		I. Sh. Eg.	12	17	29		I. Tr. In.		6	25		II. Sh. In.
	16	20		II. Oc. Dis.		18	0		I. Sh. In.		7	27		II. Tr. Eg.
	19	22	24.6	II. Ec. Re.		19	41		I. Tr. Eg.		8	55		II. * Sh. Eg.
3	0	10		I. Oc. Dis.		20	12		I. Sh. Eg.		10	59		I. * Oc. Dis.
	2	38	10.7	I. Ec. Re.	13	7	45		II. Oc. Dis.		13	52	35.8	I. * Ec. Re.
	20	56		III. Oc. Dis.		11	16	36.8	II. * Ec. Re.	23	8	9		I. * Tr. In.
	21	17		I. Tr. In.		14	47		I. Oc. Dis.		8	52		I. * Sh. In.
	21	37		I. Sh. In.		17	29	33.9	I. Ec. Re.		10	21		I. * Tr. Eg.
	23	29		I. Tr. Eg.	14	11	56		I. * Tr. In.		11	4		I. * Sh. Eg.
	23	49		I. Sh. Eg.		12	29		I. * Sh. In.		23	13		II. Oc. Dis.
	23	53	4.7	III. Ec. Re.		13	40		III. * Tr. In.	24	3	12	11.8	II. Ec. Re.
4	11	19		II. * Tr. In.		14	8		I. * Tr. Eg.		5	26		I. Oc. Dis.
	11	59		II. * Sh. In.		14	41		I. Sh. Eg.		8	21	11.6	I. * Ec. Re.
	13	47		II. * Tr. Eg.		15	21		III. Tr. Eg.	25	2	35		I. Tr. In.
	14	29		II. * Sh. Eg.		15	48		III. Sh. In.		3	21		I. Sh. In.
	18	36		I. Oc. Dis.		17	45		III. Sh. Eg.		4	47		I. Tr. Eg.
	21	6	44.3	I. Ec. Re.	15	2	42		II. Tr. In.		5	33		I. Sh. Eg.
5	15	43		I. Tr. In.		3	51		II. Sh. In.		6	56		III. Oc. Dis.
	16	5		I. Sh. In.		5	10		II. Tr. Eg.		8	43		III. * Oc. Re.
	17	55		I. Tr. Eg.		6	21		II. Sh. Eg.		10	5	56.1	III. * Ec. Dis.
	18	17		I. Sh. Eg.		9	13		I. * Oc. Dis.		11	50	45.3	III. * Ec. Re.
6	5	28		II. Oc. Dis.		11	58	11.7	I. * Ec. Re.		18	8		II. Tr. In.
	8	40	10.1	II. * Ec. Re.	16	6	22		I. Tr. In.		19	43		II. Sh. In.
	13	2		I. * Oc. Dis.		6	57		I. Sh. In.		20	36		II. Tr. Eg.
	15	35	16.2	I. Ec. Re.		8	34		I. * Tr. Eg.		22	13		II. Sh. Eg.
7	10	9		I. * Tr. In.		9	9		I. * Sh. Eg.		23	52		I. Oc. Dis.
	10	21		III. * Tr. In.		20	54		II. Oc. Dis.	26	2	49	49.0	I. Ec. Re.
	10	34		I. * Sh. In.	17	0	35	21.6	II. Ec. Re.		21	2		I. Tr. In.
	11	50		III. * Sh. In.		3	40		I. Oc. Dis.		21	49		I. Sh. In
	11	59		III. * Tr. Eg.		6	26	46.3	I. Ec. Re.		23	14		I. Tr. Eg.
	12	21		I. * Tr. Eg.	18	0	49		I. Tr. In.	27	0	2		I. Sh. Eg.
	12	46		I. * Sh. Eg.		1	26		I. Sh. In.		12	23		II. * Oc. Dis.
	13	46		III. * Sh. Eg.		3	1		I. Tr. Eg.		16	30	13.5	II. Ec. Re.
8	0	26		II. Tr. In.		3	33		III. Oc. Dis.		18	19		I. Oc. Dis.
	1	16		II. Sh. In.		3	38		I. Sh. Eg.		21	18	24.7	I. Ec. Re.
	2	54		II. Tr. Eg.		5	16		III. Oc. Re.	28	15	29		I. Tr. In.
	3	46		II. Sh. Eg.		6	7	45.7	III. Ec. Dis.		16	18		I. Sh. In.
	7	28		I. Oc. Dis.		7	51	38.1	III. Ec. Re.		17	41		I. Tr. Eg.
	10	3	52.8	I. * Ec. Re.		15	50		II. Tr. In.		18	31		I. Sh. Eg.
9	4	36		I. Tr. In.		17	8		II. Sh. In.		20	27		III. Tr. In.
	5	3		I. Sh. In.		18	18		II. Tr. Eg.		22	16		III. Tr. Eg.
	6	48		I. Tr. Eg.		19	38		II. Sh. Eg.		23	47		III. Sh. In.
	7	15		I. Sh. Eg.		22	6		I. Oc. Dis.	29	1	45		III. Sh. Eg.
	18	36		II. Oc. Dis.	19	0	55	22.2	I. Ec. Re.		7	18		II. Tr. In.
	21	58	45.6	II. Ec. Re.		19	15		I. Tr. In.		9	0		II. * Sh. In.
10	1	55		I. Oc. Dis.		19	55		I. Sh. In.		9	46		II. * Tr. Eg.
	4	32	25.6	I. Ec. Re.		21	27		I. Tr. Eg.		11	30		II. * Sh. Eg.
	23	3		I. Tr. In.		22	7		I. Sh. Eg.		12	46		I. * Oc. Dis.
	23	31		I. Sh. In.	20	10	3		II. * Oc. Dis.		15	47	4.5	I. Ec. Re.
11	0	14		III. Oc. Dis.		13	53	18.4	II. * Ec. Re.	30	9	55		I. * Tr. In.
	1	15		I. Tr. Eg.		16	32		I. Oc. Dis.		10	47		I. * Sh. In.
	1	43		I. Sh. Eg.		19	23	57.0	I. Ec. Re.		12	7		I. * Tr. Eg.
	1	53		III. Oc. Re.	21	13	42		I. * Tr. In.		13	0		I. * Sh. Eg.
	2	9	21.2	III. Ec. Dis.		14	23		I. Sh. In.					

NOTE.—In. denotes ingress: Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

JUNE.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at $11^h\ 0^m$ *for an Inverting Telescope.*

Day.	West.	East.
1	3· 4· 2·	·1
2	4· ·3 1· ·2	
3	4· ·3	·1 ·2
4	4· ·1	2 ·3
5	·4 ·2	1· ·3
6	·4 ·1	·2 3·
7	1· 3· ·4	2·
8	3· 2· ·4	·1
9	·3 2 1·	·4
10	·3	·1 ·2 ·4
11	·1	2· ·3 ·4
12	2·	1· ·3 ·4
13	·1	3· 4· ·2 ●
14		1· 3· 2· 4·
15	3· 2·	4· ·1 ●
16	·3 ·2 1·	4·
17	·3 4·	·1 ·2
18	4· 1·	3 2
19	4· 2·	1· ·3
20	4· ·1	3· ·2 ●
21	·4	1· 3· 2·
22	·4 3· 2·	·1 ●
23	·4 3· ·2 1·	
24	3 4	·1 ·2
25	1·	4 2· ·3 ●
26	2·	·1 ·4 ·3
27	·1	2 3· ·4
28		1· 3· 2· 4·
29	3· 1 2·	4·
30	1· 3· ·2	4·

WASHINGTON MEAN TIME.

JULY.

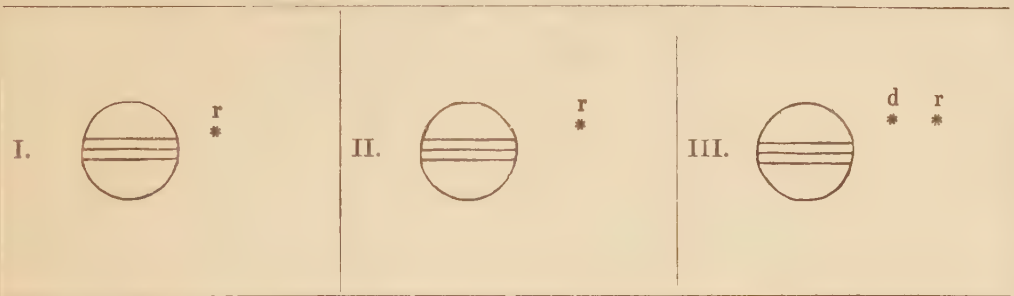
d	h	m	s			
1	1	34		II.	Oc.	Dis.
	5	49	14.8	II.	Ec.	Re.
	7	12		I.	Oc.	Dis.
	10	15	41.7	I. *	Ec.	Re.
2	4	22		I.	Tr.	In.
	5	15		I.	Sh.	In.
	6	34		I.	Tr.	Eg.
	7	28		I.	Sh.	Eg.
	10	22		III. *	Oc.	Dis.
	12	13		III. *	Oc.	Re.
	14	4	13.5	III.	Ec.	Dis.
	15	50	0.7	III.	Ec.	Re.
	20	27		II.	Tr.	In.
	22	17		II.	Sh.	In.
	22	56		II.	Tr.	Eg.
3	0	48		II.	Sh.	Eg.
	1	39		I.	Oc.	Dis.
	4	44	19.8	I.	Ec.	Re.
	22	49		I.	Tr.	In.
	23	44		I.	Sh.	In.
4	1	1		I.	Tr.	Eg.
	1	57		I.	Sh.	Eg.
	14	45		II.	Oc.	Dis.
	19	7	20.9	II.	Ec.	Re.
	20	6		I.	Oc.	Dis.
	23	12	56.9	I.	Ec.	Re.
5	17	16		I.	Tr.	In.
	18	13		I.	Sh.	In.
	19	28		I.	Tr.	Eg.
	20	26		I.	Sh.	Eg.
	23	57		III.	Tr.	In.
6	1	49		III.	Tr.	Eg.
	3	46		III.	Sh.	In.
	5	45		III.	Sh.	Eg.
	9	36		II. *	Tr.	In.
	11	34		II. *	Sh.	In.
	12	7		II. *	Tr.	Eg.
	14	5		II.	Sh.	Eg.
	14	33		I.	Oc.	Dis.
	17	41	37.5	I.	Ec.	Re.
7	11	43		I. *	Tr.	In.
	12	41		I. *	Sh.	In.
	13	55		I.	Tr.	Eg.
	14	54		I.	Sh.	Eg.
8	3	57		II.	Oc.	Dis.
	8	26	29.2	II. *	Ec.	Re.
	9	0		I. *	Oc.	Dis.
	12	10	15.7	I. *	Ec.	Re.
9	6	10		I.	Tr.	In.
	7	10		I.	Sh.	In.
	8	22		I. *	Tr.	Eg.
	9	23		I. *	Sh.	Eg.
	13	54		III.	Oc.	Dis.
	15	47		III.	Oc.	Re.
	18	3	1.1	III.	Ec.	Dis.
	19	49	46.7	III.	Ec.	Re.
	22	46		II.	Tr.	In.
10	0	52		II.	Sh.	In.
	1	18		II.	Tr.	Eg.
	3	23		II.	Sh.	Eg.
	3	27		I.	Oc.	Dis.
	6	38	54.6	I.	Ec.	Re.
11	0	38		I.	Tr.	In.
	1	39		I.	Sh.	In.
	2	50		I.	Tr.	Eg.
11	3	52		I.	Sh.	Eg.
	17	9		II.	Oc.	Dis.
	21	44	39.3	II.	Ec.	Re.
	21	55		I.	Oc.	Dis.
12	1	7	32.7	I.	Ec.	Re.
	19	5		I.	Tr.	In.
	20	7		I.	Sh.	In.
	21	17		I.	Tr.	Eg.
	22	20		I.	Sh.	Eg.
13	3	31		III.	Tr.	In.
	5	26		III.	Tr.	Eg.
	7	45		III.	Sh.	In.
	9	45		III. *	Sh.	Eg.
	11	58		II. *	Tr.	In.
	14	9		II.	Sh.	In.
	14	29		II.	Tr.	Eg.
	16	22		I.	Oc.	Dis.
	16	40		II.	Sh.	Eg.
	19	36	14.2	I.	Ec.	Re.
14	13	33		I.	Tr.	In.
	14	36		I.	Sh.	In.
	15	45		I.	Tr.	Eg.
	16	49		I.	Sh.	Eg.
15	6	22		II.	Oc.	Dis.
	10	49		I. *	Oc.	Dis.
	11	3	53.4	II. *	Ec.	Re.
	14	4	53.6	I.	Ec.	Re.
16	8	0		I. *	Tr.	In.
	9	5		I. *	Sh.	In.
	10	13		I. *	Tr.	Eg.
	11	18		I. *	Sh.	Eg.
	17	29		III.	Oc.	Dis.
	19	26		III.	Oc.	Re.
	22	1	47.5	III.	Ec.	Dis.
	23	49	32.9	III.	Ec.	Re.
17	1	10		II.	Tr.	In.
	3	26		II.	Sh.	In.
	3	41		II.	Tr.	Eg.
	5	17		I.	Oc.	Dis.
	5	57		II.	Sh.	Eg.
	8	33	33.2	I. *	Ec.	Re.
18	2	28		I.	Tr.	In.
	3	34		I.	Sh.	In.
	4	40		I.	Tr.	Eg.
	5	47		I.	Sh.	Eg.
	19	36		II.	Oc.	Dis.
	23	44		I.	Oc.	Dis.
19	0	22	6.5	II.	Ec.	Re.
	3	2	12.5	I.	Ec.	Re.
	20	55		I.	Tr.	In.
	22	3		I.	Sh.	In.
	23	8		I.	Tr.	Eg.
20	0	16		I.	Sh.	Eg.
	7	9		III.	Tr.	In.
	9	7		III. *	Tr.	Eg.
	11	44		III. *	Sh.	In.
	13	45		III.	Sh.	Eg.
	14	23		II.	Tr.	In.
	16	43		II.	Sh.	In.
	16	54		II.	Tr.	Eg.
	18	12		I.	Oc.	Dis.
	19	14		II.	Sh.	Eg.
	21	30	54.3	I.	Ec.	Re.
21	15	23		I.	Tr.	In.
	16	32		I.	Sh.	In.
21	17	36		I.	Tr.	Eg.
	18	45		I.	Sh.	Eg.
22	8	50		II. *	Oc.	Dis.
	12	39		I.	Oc.	Dis.
	13	41	25.6	II.	Ec.	Re.
	15	59	34.7	I.	Ec.	Re.
23	9	51		I. *	Tr.	In.
	11	0		I. *	Sh.	In.
	12	4		I.	Tr.	Eg.
	13	13		I.	Sh.	Eg.
	21	10		III.	Oc.	Dis.
	23	10		III.	Oc.	Re.
24	2	1	11.1	III.	Ec.	Dis.
	3	36		II.	Tr.	In.
	3	49	57.5	III.	Ec.	Re.
	6	1		II.	Sh.	In.
	6	7		II.	Tr.	Eg.
	7	7		I.	Oc.	Dis.
	8	32		II. *	Sh.	Eg.
	10	28	14.8	I. *	Ec.	Re.
25	4	19		I.	Tr.	In.
	5	29		I.	Sh.	In.
	6	32		I.	Tr.	Eg.
	7	42		I.	Sh.	Eg.
	22	5		II.	Oc.	Dis.
26	1	35		I.	Oc.	Dis.
	2	59	41.7	II.	Ec.	Re.
	4	56	54.7	I.	Ec.	Re.
	22	47		I.	Tr.	In.
	23	58		I.	Sh.	In.
27	1	0		I.	Tr.	Eg.
	2	11		I.	Sh.	Eg.
	10	51		III. *	Tr.	In.
	12	53		III.	Tr.	Eg.
	15	43		III.	Sh.	In.
	16	49		II.	Tr.	In.
	17	45		III.	Sh.	Eg.
	19	18		II.	Sh.	In.
	19	21		II.	Tr.	Eg.
	20	3		I.	Oc.	Dis.
	21	49		II.	Sh.	Eg.
	23	25	37.0	I.	Ec.	Re.
28	17	15		I.	Tr.	In.
	18	27		I.	Sh.	In.
	19	28		I.	Tr.	Eg.
	20	40		I.	Sh.	Eg.
29	11	20		II. *	Oc.	Dis.
	14	30		I.	Oc.	Dis.
	16	19	4.9	II.	Ec.	Re.
	17	54	18.4	I.	Ec.	Re.
30	11	43		I.	Tr.	In.
	12	56		I.	Sh.	In.
	13	56		I.	Tr.	Eg.
	15	9		I.	Sh.	Eg.
31	0	55		III.	Oc.	Dis.
	2	57		III.	Oc.	Re.
	6	0	0.0	III.	Ec.	Dis.
	6	3		II.	Tr.	In.
	7	49	48.3	III. *	Ec.	Re.
	8	36		II. *	Sh.	In.
	8	36		II. *	Tr.	Eg.
	8	58		I. *	Oc.	Dis.
	11	7		II. *	Sh.	Eg.
	12	22	59.0	I.	Ec.	Re.

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

JULY.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at $10^h\ 0^m$ *for an Inverting Telescope.*

Day.	West.	East.
1	·3	·2 4· ·1 ●
2	1· ·3	2· 4·
3	2·	4· ·1 ·3
4	4· 1· ·2	3·
5	4·	1· 3· ·2
6	2· 4· 3· ·1	
7	4· 3· ·2	1·
8	·4 ·3	·2 ·1 ●
9	·4 3 1·	2·
10	4· 2·	·1 ·3
11	4 1· 2	3·
12		4 1· 2 3·
13	·1 3·	2· ·4
14	3· 2·	1· 4·
15	·3	1 4· ·2 ●
16	1· ·3	2· 4·
17	2·	·1 ·3 4·
18	2 1·	·3 4·
19		·1 2 4 3·
20	·1 3 4·	2·
21	3· 2· 4·	1·
22	4· ·3 ·1	·2 ●
23	1· 4· ·3	2·
24	4· 2·	·3 ·1 ●
25	·4 ·2 1·	·3
26	·4	·1 2 3·
27	·4 1· 3 ·	2·
28	3· 2· ·4	1·
29	·3 ·1 2	·4
30	·3	1· 2· ·4
31	2·	·3 ·4 ·1 ●

WASHINGTON MEAN TIME.

AUGUST.

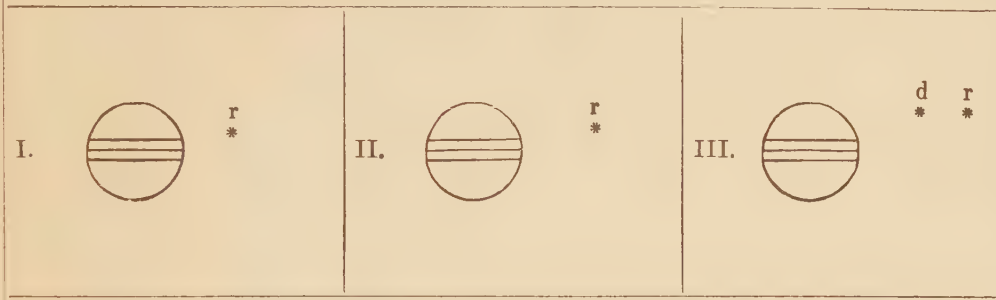
d	h	m	s			d	h	m	s			d	h	m	s		
1	6	11		I.	Tr. In.	11	1	46		III.	Sh. Eg.	21	16	13		II.	Tr. Eg.
	7	25		I.	Sh. In.		2	59		II.	Sh. Eg.		16	20		II.	Sh. In.
	8	24		I.	* Tr. Eg.		3	15	7.9	I.	Ec. Re.		17	55	55.1	III.	Ec. Dis.
	9	38		I.	* Sh. Eg.		21	1		I.	Tr. In.		18	7	19.0	I.	Ec. Re.
2	0	36		II.	Oc. Dis.		22	18		I.	Sh. In.		18	51		II.	Sh. Eg.
	3	26		I.	Oc. Dis.		23	15		I.	Tr. Eg.		19	48	55.1	III.	Ec. Re.
	5	37	23.3	II.	Ec. Re.	12	0	32		I.	Sh. Eg.	22	11	54		I.	Tr. In.
	6	51	39.5	I.	Ec. Re.		16	28		II.	Oc. Dis.		13	11		I.	Sh. In.
3	0	39		I.	Tr. In.		18	16		I.	Oc. Dis.		14	8		I.	Tr. Eg.
	1	53		I.	Sh. In.		21	34	36.6	II.	Ec. Re.		15	25		I.	Sh. Eg.
	2	52		I.	Tr. Eg.		21	43	50.4	I.	Ec. Re.	23	8	23		II.	* Oc. Dis.
	4	7		I.	Sh. Eg.	13	15	29		I.	Tr. In.		9	8		I.	* Oc. Dis.
	14	39		III.	Tr. In.		16	46		I.	Sh. In.		12	36	1.0	I.	Ec. Re.
	16	42		III.	Tr. Eg.		17	43		I.	Tr. Eg.		13	30	47.0	II.	Ec. Re.
	19	18		II.	Tr. In.		19	0		I.	Sh. Eg.	24	6	23		I.	Tr. In.
	19	43		III.	Sh. In.	14	8	37		III.	* Oc. Dis.		7	40		I.	* Sh. In.
	21	45		III.	Sh. Eg.		10	44		III.	Oc. Re.		8	37		I.	* Tr. Eg.
	21	51		II.	Tr. Eg.		11	6		II.	Tr. In.		9	53		I.	Sh. Eg.
	21	53		II.	Sh. In.		12	45		I.	Oc. Dis.	25	2	28		III.	Tr. In.
	21	54		I.	Oc. Dis.		13	39		II.	Tr. Eg.		2	58		II.	Tr. In.
4	0	24		II.	Sh. Eg.		13	45		II.	Sh. Eg.		3	37		I.	Oc. Dis.
	1	20	21.9	I.	Ec. Re.		13	57	20.0	III.	Ec. Dis.		4	38		III.	Tr. Eg.
	19	7		I.	Tr. In.		15	49	15.0	III.	Ec. Re.		5	31		II.	Tr. Eg.
	20	22		I.	Sh. In.		16	12	31.3	I.	Ec. Re.		5	37		II.	Sh. In.
	21	21		I.	Tr. Eg.		16	16		II.	Sh. Eg.		7	4	42.5	I.	Ec. Re.
	22	36		I.	Sh. Eg.	15	9	58		I.	* Tr. In.		7	41		III.	* Sh. In.
5	13	53		II.	Oc. Dis.		11	15		I.	Sh. In.		8	8		II.	* Sh. Eg.
	16	23		I.	Oc. Dis.		12	12		I.	Tr. Eg.		9	47		III.	Sh. Eg.
	18	56	49.2	II.	Ec. Re.		13	29		I.	Sh. Eg.	26	0	52		I.	Tr. In
	19	49	3.6	I.	Ec. Re.	16	5	46		II.	Oc. Dis.		2	9		I.	Sh. In.
6	13	36		I.	Tr. In.		7	13		I.	Oc. Dis.		3	6		I.	Tr. Eg.
	14	51		I.	Sh. In.		10	41	12.7	I.	Ec. Re.		4	22		I.	Sh. Eg.
	15	49		I.	Tr. Eg.		10	52	57.3	II.	Ec. Re.		21	43		II.	Oc. Dis.
	17	5		I.	Sh. Eg.	17	4	27		I.	Tr. In.		22	6		I.	Oc. Dis.
7	4	44		III.	Oc. Dis.		5	44		I.	Sh. In.	27	1	33	25.6	I.	Ec. Re.
	6	49		III.	Oc. Re.		6	41		I.	Tr. Eg.		2	50	15.2	II.	Ec. Re.
	8	33		II.	* Tr. In.		7	58		I.	* Sh. Eg.		19	21		I.	Tr. In.
	9	58	48.3	III.	* Ec. Dis.		22	28		III.	Tr. In.		20	38		I.	Sh. In.
	10	51		I.	Oc. Dis.	18	0	23		II.	Tr. In.		21	35		I.	Tr. Eg.
	11	6		II.	Tr. Eg.		0	36		III.	Tr. Eg.		22	51		I.	Sh. Eg.
	11	11		II.	Sh. In.		1	42		I.	Oc. Dis.	28	16	17		II.	Tr. In.
	11	49	39.5	III.	Ec. Re.		2	56		II.	Tr. Eg.		16	35		I.	Oc. Dis.
	13	42		II.	Sh. Eg.		3	2		II.	Sh. In.		16	37		III.	Oc. Dis.
	14	17	44.7	I.	Ec. Re.		3	42		III.	Sh. In.		18	48		III.	Oc. Re.
8	8	4		I.	* Tr. In.		5	9	55.3	I.	Ec. Re.		18	50		II.	Tr. Eg.
	9	20		I.	* Sh. In.		5	33		II.	Sh. Eg.		18	54		II.	Sh. In.
	10	18		I.	* Tr. Eg.		5	47		III.	Sh. Eg.		20	2	6.7	I.	Ec. Re.
	11	34		I.	Sh. Eg.		22	56		I.	Tr. In.		21	26		II.	Sh. Eg.
9	3	10		II.	Oc. Dis.	19	0	13		I.	Sh. In.		21	54	58.1	III.	Ec. Dis.
	5	19		I.	Oc. Dis.		1	10		I.	Tr. Eg.		23	49	3.9	III.	Ec. Re.
	8	15	9.0	II.	* Ec. Re.		2	27		I.	Sh. Eg.	29	13	50		I.	Tr. In.
	8	46	25.5	I.	* Ec. Re.		19	5		II.	Oc. Dis.		15	7		I.	Sh. In.
10	2	32		I.	Tr. In.		20	10		I.	Oc. Dis.		16	4		I.	Tr. Eg.
	3	49		I.	Sh. In.		23	38	37.7	I.	Ec. Re.		17	20		I.	Sh. Eg.
	4	46		I.	Tr. Eg.	20	0	12	26.1	II.	Ec. Re.	30	11	3		II.	Oc. Dis.
	6	3		I.	Sh. Eg.		17	25		I.	Tr. In.		11	4		I.	Oc. Dis.
	18	31		III.	Tr. In.		18	42		I.	Sh. In.		14	30	48.1	I.	Ec. Re.
	20	37		III.	Tr. Eg.		19	39		I.	Tr. Eg.		16	8	35.8	II.	Ec. Re.
	21	49		II.	Tr. In.		20	56		I.	Sh. Eg.	31	8	19		I.	* Tr. In.
	23	42		III.	Sh. In.	21	12	35		III.	Oc. Dis.		9	36		I.	Sh. In.
	23	47		I.	Oc. Dis.		13	40		II.	Tr. In.		10	33		I.	Tr. Eg.
11	0	22		II.	Tr. Eg.		14	39		I.	Oc. Dis.		11	49		I.	Sh. Eg.
	0	28		II.	Sh. In.		14	44		III.	Oc. Re.						

NOTE.—In. denotes ingress: Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

AUGUST.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 9h 0m for an Inverting Telescope.

Day.	West.	East.
1	·2 1·	·3 ·4
2	·1 ·2	3· 4.
3	1·	3· 2· 4·
4	3· ·2	·1 4·
5	3· ·1 ·2	4·
6	·3 4·	1· ·2
7	2· 4· ·1	·3
8	1· 4· ·2	·3
9	4·	·1 ·2 3·
10	·4 1·	3· 2·
11	·4 3· ·2	·1
12	·4 3· ·1 ·2	
13	·3 ·4	1· ·2
14	·1 ·4 2·	·3 ●
15	2· 1	·4 ·3
16		3· ·4 ·1 ● ·2 ●
17	1·	3· ·2 ·4
18	3· ·2	·1 ·4
19	3· ·1 ·2	4·
20	·3	1· ·2 4·
21	·1 ·3	2· 4·
22	2·	·1 ·1 ·3
23	4· ·	1 3· ·2 ●
24	4· 1·	·2 ·3
25	4· ·2 ·3	·1
26	4· 3· ·2 1·	
27	·4 ·3	·1 ·2
28	·4 ·1 ·3	2·
29	·4 2·	1· ·3
30	·4 ·1 ·2	·3
31	1·	·4 ·2 3·

WASHINGTON MEAN TIME.

SEPTEMBER.

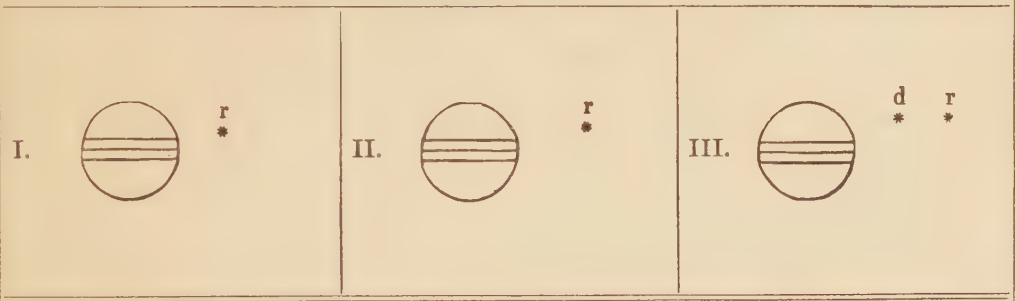
d	h	m	s			d	h	m	s			d	h	m	s		
1	5	33		I.	Oc. Dis.	11	1	29		I.	Tr. Eg.	21	0	1	43.5	II.	Ec. Re.
	5	36		II.	Tr. In.		2	42		I.	Sh. Eg.		14	14		I.	Tr. In.
	6	32		III.	Tr. In.		20	28		I.	Oc. Dis.		15	22		I.	Sh. In.
	8	9		II. *	Tr. Eg.		21	34		II.	Tr. In.		16	27		I.	Tr. Eg.
	8	11		II. *	Sh. In.		23	51	42.0	I.	Ec. Re.		17	35		I.	Sh. Eg.
	8	44		III. *	Tr. Eg.	12	0	4		II.	Sh. In.	22	11	26		I.	Oc. Dis.
	8	59	30.4	I. *	Ec. Re.		0	8		II.	Tr. Eg.		13	37		II.	Tr. In.
	10	43		II.	Sh. Eg.		0	52		III.	Oc. Dis.		14	43	50.1	I.	Ec. Re.
	11	41		III.	Sh. In.		2	35		II.	Sh. Eg.		15	56		II.	Sh. In.
	13	47		III.	Sh. Eg.		3	6		III.	Oc. Re.		16	11		II.	Tr. Eg.
2	2	49		I.	Tr. In.		5	53	21.4	III.	Ec. Dis.		18	27		II.	Sh. Eg.
	4	5		I.	Sh. In.		7	49	40.8	III. *	Ec. Re.		19	4		III.	Tr. In.
	5	2		I.	Tr. Eg.		17	46		I.	Tr. In.		21	20		III.	Tr. Eg.
	6	18		I.	Sh. Eg.		18	58		I.	Sh. In.		23	38		III.	Sh. In.
3	0	2		I.	Oc. Dis.		19	59		I.	Tr. Eg.	23	1	48		III.	Sh. Eg.
	0	24		II.	Oc. Dis.		21	11		I.	Sh. Eg.		8	44		I.	Tr. In.
	3	28	13.4	I.	Ec. Re.	13	14	58		I.	Oc. Dis.		9	51		I.	Sh. In.
	5	28	2.6	II.	Ec. Re.		16	28		II.	Oc. Dis.		10	57		I.	Tr. Eg.
	21	18		I.	Tr. In.		18	20	23.5	I.	Ec. Re.		12	4		I.	Sh. Eg.
	22	33		I.	Sh. In.		21	24	5.5	II.	Ec. Re.	24	5	55		I.	Oc. Dis.
	23	31		I.	Tr. Eg.	14	12	15		I.	Tr. In.		8	36		II.	Oc. Dis.
4	0	46		I.	Sh. Eg.		13	26		I.	Sh. In.		9	12	33.1	I.	Ec. Re.
	18	31		I.	Oc. Dis.		14	28		I.	Tr. Eg.		13	21	0.2	II.	Ec. Re.
	18	55		II.	Tr. In.		15	39		I.	Sh. Eg.	25	3	13		I.	Tr. In.
	20	43		III.	Oc. Dis.	15	9	27		I.	Oc. Dis.		4	19		I.	Sh. In.
	21	28		II.	Tr. Eg.		10	55		II.	Tr. In.		5	27		I.	Tr. Eg.
	21	29		II.	Sh. In.		12	49	4.5	I.	Ec. Re.		6	32		I.	Sh. Eg.
	21	56	54.5	I.	Ec. Re.		13	21		II.	Sh. In.	26	0	25		I.	Oc. Dis.
	22	55		III.	Oc. Re.		13	29		II.	Tr. Eg.		2	58		II.	Tr. In.
5	0	1		II.	Sh. Eg.		14	50		III.	Tr. In.		3	41	12.9	I.	Ec. Re.
	1	53	53.4	III.	Ec. Dis.		15	52		II.	Sh. Eg.		5	14		II.	Sh. In.
	3	49	5.8	III.	Ec. Re.		17	5		III.	Tr. Eg.		5	33		II.	Tr. Eg.
	15	48		I.	Tr. In.		19	39		III.	Sh. In.		7	45		II. *	Sh. Eg.
	17	2		I.	Sh. In.		21	48		III.	Sh. Eg.		9	19		III.	Oc. Dis.
	18	1		I.	Tr. Eg.	16	6	45		I.	Tr. In.		11	35		III.	Oc. Re.
	19	15		I.	Sh. Eg.		7	55		I. *	Sh. In.		13	50	55.8	III.	Ec. Dis.
6	13	0		I.	Oc. Dis.		8	58		I.	Tr. Eg.		15	49	30.6	III.	Ec. Re.
	13	45		II.	Oc. Dis.		10	8		I.	Sh. Eg.		21	43		I.	Tr. In.
	16	25	36.1	I.	Ec. Re.	17	3	57		I.	Oc. Dis.		22	48		I.	Sh. In.
	18	46	22.9	II.	Ec. Re.		5	51		II.	Oc. Dis.		23	57		I.	Tr. Eg.
7	10	17		I.	Tr. In.		7	17	47.7	I. *	Ec. Re.	27	1	1		I.	Sh. Eg.
	11	31		I.	Sh. In.		10	43	26.5	II.	Ec. Re.		18	55		I.	Oc. Dis.
	12	30		I.	Tr. Eg.	18	1	15		I.	Tr. In.		21	58		II.	Oc. Dis.
	13	44		I.	Sh. Eg.		2	24		I.	Sh. In.		22	9	53.9	I.	Ec. Re.
8	7	30		I. *	Oc. Dis.		3	28		I.	Tr. Eg.	28	2	39	15.2	II.	Ec. Re.
	8	14		II. *	Tr. In.		4	37		I.	Sh. Eg.		16	13		I.	Tr. In.
	10	39		III.	Tr. In.		22	26		I.	Oc. Dis.		17	17		I.	Sh. In.
	10	46		II.	Sh. In.	19	0	16		II.	Tr. In.		18	27		I.	Tr. Eg.
	10	48		II.	Tr. Eg.		1	46	28.1	I.	Ec. Re.		19	30		I.	Sh. Eg.
	10	54	17.9	I.	Ec. Re.		2	39		II.	Sh. In.	29	13	24		I.	Oc. Dis.
	12	52		III.	Tr. Eg.		2	50		II.	Tr. Eg.		16	21		II.	Tr. In.
	13	18		II.	Sh. Eg.		5	4		III.	Oc. Dis.		16	38	34.4	I.	Ec. Re.
	15	40		III.	Sh. In.		5	10		II.	Sh. Eg.		18	31		II.	Sh. In.
	17	47		III.	Sh. Eg.		7	19		III. *	Oc. Re.		18	55		II.	Tr. Eg.
9	4	47		I.	Tr. In.		9	52	10.8	III.	Ec. Dis.		21	2		II.	Sh. Eg.
	6	0		I.	Sh. In.		11	49	37.6	III.	Ec. Re.		23	21		III.	Tr. In.
	7	0		I.	Tr. Eg.		19	44		I.	Tr. In.	30	1	38		III.	Tr. Eg.
	8	13		I. *	Sh. Eg.		20	53		I.	Sh. In.		3	37		III.	Sh. In.
10	1	59		I.	Oc. Dis.		21	57		I.	Tr. Eg.		5	49		III.	Sh. Eg.
	3	7		II.	Oc. Dis.		23	6		I.	Sh. Eg.		10	43		I.	Tr. In.
	5	23	1.1	I.	Ec. Re.	20	16	56		I.	Oc. Dis.		11	45		I.	Sh. In.
	8	5	47.0	II. *	Ec. Re.		19	12		II.	Oc. Dis.		12	57		I.	Tr. Eg.
	23	16		I.	Tr. In.		20	15	9.3	I.	Ec. Re.		13	59		I.	Sh. Eg.
11	0	29		I.	Sh. In.												

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

SEPTEMBER.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 8h 0m for an Inverting Telescope.

Day.	West.	East.
1	○ 3· ○ 2·	○ ·4 ·1 ●
2	3· ·2 1· ○	○ ·4
3	·3	○ ·2 ·1 ·4
4	·3 1·	○ 2· ·4
5	2·	○ ·3 4·
6	·2 ·1	○ ·3 4·
7		○ 1· ·2 4· ·3
8	·2 ·3 ·4	○ ·1 ●
9	3· ·2 4· 1·	○
10	4· ·3	○ .1 ·2 ●
11	4· ·3 1·	○ 2·
12	4· 2·	○ ·3 ·1
13	·4 ·2 ·1	○ ·3
14	·4	○ 1· ·2 3·
15	·4 ·1	○ ·2 ·3
16	○ 1· 2· ·4 ·3	○
17	3·	○ ·1 ·4 ·2 ●
18	·3 1·	○ 2· ·4
19	2·	○ ·3 ·1 ·4
20	·2 ·1	○ ·3 ·4
21		○ 1· ·2 3· 4·
22	·1	○ 2· 3· 4·
23	2· 3· 1	○ · 4·
24	3· ·	○ 2 4· ·1 ●
25	·3 1·	○ ·4 2·
26	4· 2· ·	○ 3 ·1
27	4· ·2 1·	○ ·3
28	4·	○ ·1 ·2 3·
29	4· ·1	○ 2· 3·
30	·4 2· 3·	○ 1·

WASHINGTON MEAN TIME.

OCTOBER.

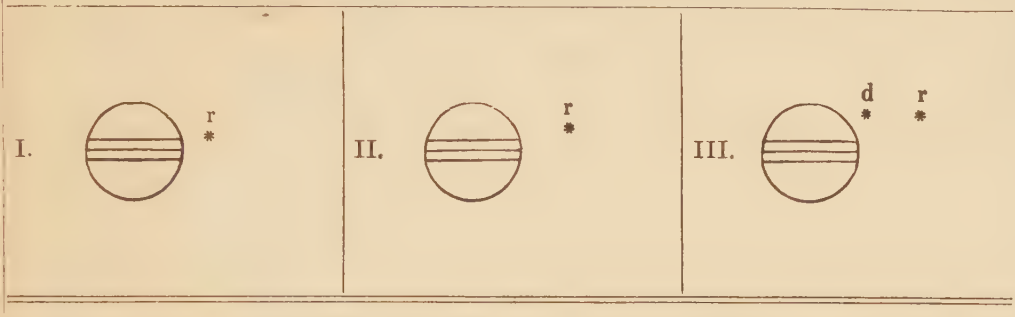
d	h	m	s			d	h	m	s			d	h	m	s		
1	7	54		I.	Oc. Dis.	11	3	57		I.	Tr. Eg.	21	16	44		I.	Tr. In.
	11	7	17.0	I.	Ec. Re.		4	52		I.	Sh. Eg.		17	30		I.	Sh. In.
	11	22		II.	Oc. Dis.		22	54		I.	Oc. Dis.		17	50		III.	Sh. Eg.
	15	58	27.2	II.	Ec. Re.	12	1	59	17.9	I.	Ec. Re.		18	58		I.	Tr. Eg.
2	5	13		I.	Tr. In.		3	34		II.	Oc. Dis.		19	44		I.	Sh. Eg.
	6	14		I.	Sh. In.		7	53	55.2	II.	Ec. Re.	22	13	54		I.	Oc. Dis.
	7	27		I.	* Tr. Eg.		20	13		I.	Tr. In.		16	51	16.5	I.	Ec. Re.
	8	28		I.	Sh. Eg.		21	7		I.	Sh. In.		19	47		II.	Oc. Dis.
3	2	24		I.	Oc. Dis.		22	27		I.	Tr. Eg.		23	49	53.1	II.	Ec. Re.
	5	35	56.2	I.	Ec. Re.		23	21		I.	Sh. Eg.	23	11	14		I.	Tr. In.
	5	43		II.	Tr. In.	13	17	24		I.	Oc. Dis.		11	59		I.	Sh. In.
	7	49		II.	Sh. In.		20	27	56.7	I.	Ec. Re.		13	28		I.	Tr. Eg.
	8	17		II.	Tr. Eg.		21	52		II.	Tr. In.		14	13		I.	Sh. Eg.
	10	20		II.	Sh. Eg.		23	41		II.	Sh. In.	24	8	24		I.	Oc. Dis.
	13	36		III.	Oc. Dis.	14	0	26		II.	Tr. Eg.		11	19	54.2	I.	Ec. Re.
	15	53		III.	Oc. Re.		2	12		II.	Sh. Eg.		14	3		II.	Tr. In.
	17	49	21.9	III.	Ec. Dis.		8	2		III.	Tr. In.		15	34		II.	Sh. In.
	19	49	6.1	III.	Ec. Re.		10	21		III.	Tr. Eg.		16	37		II.	Tr. Eg.
	23	43		I.	Tr. In.		11	36		III.	Sh. In.		18	5		II.	Sh. Eg.
4	0	43		I.	Sh. In.		13	50		III.	Sh. Eg.	25	2	41		III.	Oc. Dis.
	1	57		I.	Tr. Eg.		14	43		I.	Tr. In.		5	2		III.	Oc. Re.
	2	57		I.	Sh. Eg.		15	36		I.	Sh. In.		5	45		I.	Tr. In.
	20	54		I.	Oc. Dis.		16	58		I.	Tr. Eg.		5	45	25.4	III.	Ec. Dis.
5	0	4	36.8	I.	Ec. Re.		17	50		I.	Sh. Eg.		6	28		I.	Sh. In.
	0	45		II.	Oc. Dis.	15	11	54		I.	Oc. Dis.		7	48	41.0	III.	Ec. Re.
	5	16	39.4	II.	Ec. Re.		14	56	38.8	I.	Ec. Re.		7	59		I.	Tr. Eg.
	18	13		I.	Tr. In.		16	58		II.	Oc. Dis.		8	42		I.	Sh. Eg.
	19	12		I.	Sh. In.		21	12	54.9	II.	Ec. Re.	26	2	54		I.	Oc. Dis.
	20	27		I.	Tr. Eg.	16	9	13		I.	Tr. In.		5	48	33.8	I.	Ec. Re.
	21	25		I.	Sh. Eg.		10	4		I.	Sh. In.		9	12		II.	Oc. Dis.
6	15	24		I.	Oc. Dis.		11	28		I.	Tr. Eg.		13	7	54.9	II.	Ec. Re.
	18	33	16.3	I.	Ec. Re.		12	18		I.	Sh. Eg.	27	0	15		I.	Tr. In.
	19	6		II.	Tr. In.	17	6	24		I.	* Oc. Dis.		0	56		I.	Sh. In.
	21	6		II.	Sh. In.		9	25	17.0	I.	Ec. Re.		2	29		I.	Tr. Eg.
	21	40		II.	Tr. Eg.		11	15		II.	Tr. In.		3	10		I.	Sh. Eg.
	23	37		II.	Sh. Eg.		12	59		II.	Sh. In.		21	24		I.	Oc. Dis.
7	3	41		III.	Tr. In.		13	49		II.	Tr. Eg.	28	0	17	10.7	I.	Ec. Re.
	5	58		III.	Tr. Eg.		15	30		II.	Sh. Eg.		3	27		II.	Tr. In.
	7	37		III.	Sh. In.		22	18		III.	Oc. Dis.		4	51		II.	Sh. In.
	9	50		III.	Sh. Eg.	18	0	37		III.	Oc. Re.		6	1		II.	* Tr. Eg.
	12	43		I.	Tr. In.		1	46	42.8	III.	Ec. Dis.		7	23		II.	Sh. Eg.
	13	40		I.	Sh. In.		3	43		I.	Tr. In.		16	48		III.	Tr. In.
	14	57		I.	Tr. Eg.		3	48	47.4	III.	Ec. Re.		18	45		I.	Tr. In.
	15	54		I.	Sh. Eg.		4	33		I.	Sh. In.		19	10		III.	Tr. Eg.
8	9	54		I.	Oc. Dis.		5	58		I.	Tr. Eg.		19	25		I.	Sh. In.
	13	1	59.0	I.	Ec. Re.		6	47		I.	Sh. Eg.		19	34		III.	Sh. In.
	14	10		II.	Oc. Dis.	19	0	54		I.	Oc. Dis.		20	59		I.	Tr. Eg.
	18	35	45.8	II.	Ec. Re.		3	53	56.8	I.	Ec. Re.		21	39		I.	Sh. Eg.
9	7	13		I.	Tr. In.		6	22		II.	* Oc. Dis.		21	49		III.	Sh. Eg.
	8	9		I.	Sh. In.		10	31	0.6	II.	Ec. Re.	29	15	55		I.	Oc. Dis.
	9	27		I.	Tr. Eg.		22	14		I.	Tr. In.		18	45	52.0	I.	Ec. Re.
	10	23		I.	Sh. Eg.		23	2		I.	Sh. In.		22	37		II.	Oc. Dis.
10	4	24		I.	Oc. Dis.	20	0	28		I.	Tr. Eg.	30	2	26	39.4	II.	Ec. Re.
	7	30	37.6	I.	Ec. Re.		1	16		I.	Sh. Eg.		13	16		I.	Tr. In.
	8	29		II.	Tr. In.		19	24		I.	Oc. Dis.		13	54		I.	Sh. In.
	10	24		II.	Sh. In.		22	22	34.9	I.	Ec. Re.		15	30		I.	Tr. Eg.
	11	3		II.	Tr. Eg.	21	0	39		II.	Tr. In.		16	8		I.	Sh. Eg.
	12	55		II.	Sh. Eg.		2	16		II.	Sh. In.	31	10	25		I.	Oc. Dis.
	17	56		III.	Oc. Dis.		3	13		II.	Tr. Eg.		13	14	28.9	I.	Ec. Re.
	20	14		III.	Oc. Re.		4	47		II.	Sh. Eg.		16	51		II.	Tr. In.
	21	47	49.4	III.	Ec. Dis.		12	24		III.	Tr. In.		18	9		II.	Sh. In.
	23	48	43.6	III.	Ec. Re.		14	45		III.	Tr. Eg.		19	25		II.	Tr. Eg.
11	1	43		I.	Tr. In.		15	35		III.	Sh. In.		20	41		II.	Sh. Eg.
	2	38		I.	Sh. In.												

NOTE.—In. denotes ingress: Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

OCTOBER.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 6h 30m for an Inverting Telescope.

Day.	West.	East.
1	·4 3· ·2 ·1	
2	1· ·4 ·3	·2
3	2· ·4 ·3	·1
4	·2 1·	·4 ·3
5		·2 ·1 ·4 ·3
6	·1	2· 3· ·4
7	2· 3·	1· ·4
8	3· ·2 ·1	4·
9	·3 1	· ·2 4·
10	·3	2· 4· ·1
11	2· 1·	·3 4·
12	4·	·1 ·3 ·2
13	4· 1·	2· 3·
14	4· 2· 3	· 1·
15	4· 3· ·2 ·1	
16	4· ·3	1· ·2
17	·4 ·3	2· ·1
18	·4 2· 1·	·3
19	·4	·1 ·3 ·2
20	1· ·4	2· 3·
21	2·	3· ·1 ·4
22	·2 3· ·1	·4
23	3·	1· ·2 ·4
24	·3 ·1	2· ·4
25	1· 2·	4· ·3
26	·2	·1 ·3 4·
27	1·	·2 3· 4·
28	2·	·1 3· 4·
29	·2 3· ·1 4·	
30	3· 4·	·2 1·
31	4· ·3 ·1	2·

WASHINGTON MEAN TIME.

NOVEMBER.

d	h	m	s				d	h	m	s				d	h	m	s			
1	7	6		III.	Oc.	Dis.	5	20	40	24.9	I.	Ec.	Re.	11	11	39		II.	Tr.	Eg.
	7	46		I.	Tr.	In.	6	1	27		II.	Oc.	Dis.		12	33		II.	Sh.	Eg.
	8	22		I.	Sh.	In.		5	3	13.8	II.	Ec.	Re.		22	48		I.	Tr.	In.
	9	28		III.	Oc.	Re.		15	17		I.	Tr.	In.		23	14		I.	Sh.	In.
	9	44	37.5	III.	Ec.	Dis.		15	48		I.	Sh.	In.	12	1	2		I.	Tr.	Eg.
	10	0		I.	Tr.	Eg.		17	31		I.	Tr.	Eg.		1	28		I.	Sh.	Eg.
	10	36		I.	Sh.	Eg.		18	2		I.	Sh.	Eg.		1	41		III.	Tr.	In.
	11	49	4.3	III.	Ec.	Re.	7	12	26		I.	Oc.	Dis.		3	31		III.	Sh.	In.
2	4	55		I.	Oc.	Dis.		15	9	0.9	I.	Ec.	Re.		4	4		III.	Tr.	Eg.
	7	43	7.7	I.	Ec.	Re.		19	40		II.	Tr.	In.		5	49		III.	Sh.	Eg.
	12	2		II.	Oc.	Dis.		20	44		II.	Sh.	In.		19	57		I.	Oc.	Dis.
	15	44	37.5	II.	Ec.	Re.		22	14		II.	Tr.	Eg.		22	34	54.6	I.	Ec.	Re.
3	2	16		I.	Tr.	In.		23	16		II.	Sh.	Eg.	13	4	17		II.	Oc.	Dis.
	2	51		I.	Sh.	In.	8	9	47		I.	Tr.	In.		7	39	35.0	II.	Ec.	Re.
	4	30		I.	Tr.	Eg.		10	17		I.	Sh.	In.		17	18		I.	Tr.	In.
	5	5		I.	Sh.	Eg.		11	33		III.	Oc.	Dis.		17	43		I.	Sh.	In.
	23	25		I.	Oc.	Dis.		12	1		I.	Tr.	Eg.		19	32		I.	Tr.	Eg.
4	2	11	43.1	I.	Ec.	Re.		12	31		I.	Sh.	Eg.		19	57		I.	Sh.	Eg.
	6	16		II.	Tr.	In.		15	48	47.4	III.	Ec.	Re.	14	14	27		I.	Oc.	Dis.
	7	26		II.	Sh.	In.	9	6	56		I.	Oc.	Dis.		17	3	30.8	I.	Ec.	Re.
	8	50		II.	Tr.	Eg.		9	37	39.1	I.	Ec.	Re.		22	29		II.	Tr.	In.
	9	58		II.	Sh.	Eg.		14	52		II.	Oc.	Dis.		23	19		II.	Sh.	In.
	20	47		I.	Tr.	In.		18	21	7.4	II.	Ec.	Re.	15	1	4	*	II.	Tr.	Eg.
	21	14		III.	Tr.	In.	10	4	18		I.	Tr.	In.		1	51		II.	Sh.	Eg.
	21	20		I.	Sh.	In.		4	46		I.	Sh.	In.		11	49		I.	Tr.	In.
	23	1		I.	Tr.	Eg.		6	32		I.	Tr.	Eg.		12	12		I.	Sh.	In.
	23	32		III.	Sh.	In.		7	0		I.	Sh.	Eg.		14	3		I.	Tr.	Eg.
	23	34		I.	Sh.	Eg.	11	1	27		I.	Oc.	Dis.		14	26		I.	Sh.	Eg.
	23	36		III.	Tr.	Eg.		4	6	14.7	I.	Ec.	Re.		16	0		III.	Oc.	Dis.
5	1	49		III.	Sh.	Eg.		9	5		II.	Tr.	In.		19	48	23.4	III.	Ec.	Re.
	17	56		I.	Oc.	Dis.		10	1		II.	Sh.	In.							

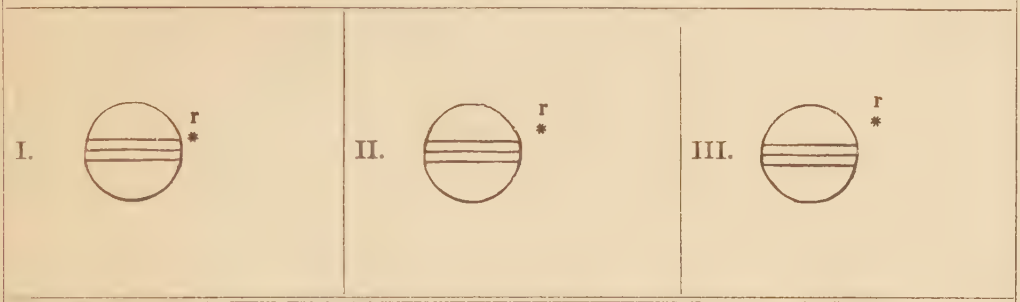
The Satellites are not visible from November 16 to the end of December, Jupiter being too near the Sun.

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington

WASHINGTON MEAN TIME.

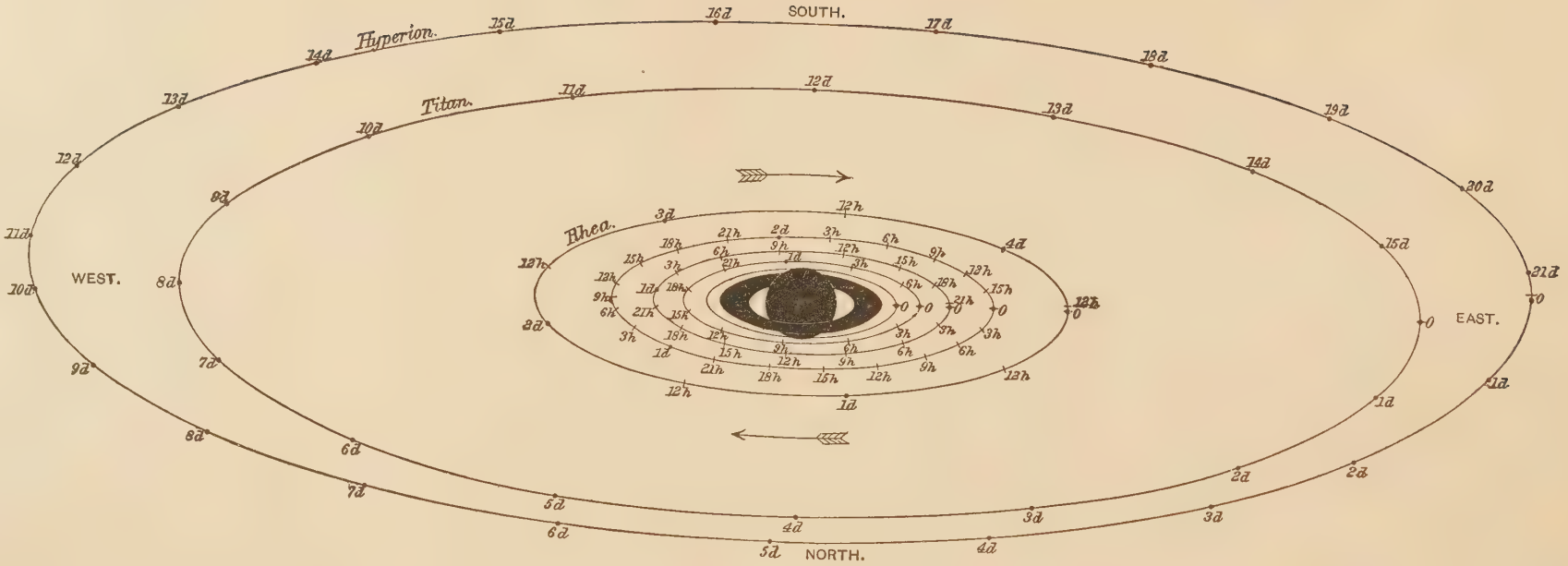
NOVEMBER.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 5h 30m for an Inverting Telescope.

Day.	West.	East.
1	4· 2· · ○ 31·	
2	4· ·2 ○ ·3	·1 ●
3	·4 1· ○ ·2 3·	
4	·4 2 ○ · ·1 3·	
5	·4 ·2 1· 3· ○	
6	3· ·4 ○ ·2 1·	
7	·3 ·1 ○ 4 2·	
8	2· 3 ○ 1· ·4	
9	·2 · ○ 1 ·3 ·4	
10	○ 1· ○ ·2 ·3 ·4	
11	○ 1 2· ·3 4·	
12	2· 1· 3· ○ 4·	
13	3· ○ ·1 4·	·2 ●
14	·3 ·1 ○ 4· 2·	
15	3 2· 4· ○ 1·	



Names of the Satellites.

I. Mimas.
II. Enceladus.
III. Tethys.
IV. Dione.
V. Rhea.
VI. Titan.
VII. Hyperion.
VIII. Japetus.

APPARENT ORBITS OF THE SEVEN INNER SATELLITES OF SATURN,

AT OPPOSITION IN 1888, *JANUARY* 23,

AS SEEN IN AN INVERTING TELESCOPE.

Mean Synodic Periods.

	d	h
I.	0	22.6
II.	1	8.9
III.	1	21.3
IV.	2	17.7
V.	4	12.5
VI.	15	23.3
VII.	21	7.8
VIII.	79	22.0

WASHINGTON MEAN TIMES OF GREATEST ELONGATION, ETC.

In the diagram on the preceding page, the points of the orbits marked "o" are those of the eastern elongation, as seen in an inverting telescope. The apparent positions of a satellite at any time may be marked on the diagram by counting around the orbit the interval in days and hours which has elapsed since the last east elongation. The times of these elongations may be found from the following tables. Mimas can be seen only within a few hours of each elon ation: the time of every elongation visible at Washington is therefore given. The times of other elongations of any satellite in the same direction may be found by adding or subtracting any multiple of the period. For the three outer satellites the times of elongation and conjunction are given. The following abbreviations are used:—

E., East Elongation,
I., Inferior Conjunction (north of planet),
W., West Elongation,
S., Superior Conjunction (south of planet).

MIMAS.

Greatest Elongations Visible at Washington.

d h	d h	d h	d h	d h	d h
Jan. 1 15.4 W.	Jan. 30 9.2 E.	Mar. 3 8.7 E.	Apr. 11 11.4 W.	Oct. 23 15.0 W.	Dec. 1 17.7 E.
2 14.0 W.	Feb. 3 14.9 W.	8 13.2 W.	12 10.0 W.	29 18.0 E.	2 16.3 E.
3 12.7 W.	4 13.5 W.	9 11.8 W.	13 8.6 W.	30 16.6 E.	3 15.0 E.
4 11.3 W.	5 12.2 W.	10 10.4 W.	18 13.1 E.	31 15.3 E.	4 13.6 E.
5 9.9 W.	6 10.8 W.	11 9.0 W.	19 11.7 E.	Nov. 1 13.9 E.	10 16.6 W.
9 15.7 E.	7 9.4 W.	16 13.6 E.	20 10.3 E.	6 18.3 W.	11 15.2 W.
10 14.3 E.	12 13.7 E.	17 12.2 E.	21 9.0 E.	7 16.9 W.	12 13.8 W.
11 12.9 E.	13 12.3 E.	18 10.8 E.	26 13.4 W.	8 15.5 W.	13 12.5 W.
12 11.5 E.	14 10.9 E.	19 9.3 E.	27 12.0 W.	9 14.2 W.	14 11.1 W.
13 10.2 E.	15 9.6 E.	20 7.9 E.	28 10.6 W.	14 18.5 E.	18 16.8 E.
18 14.5 W.	16 8.2 E.	24 13.7 W.	29 9.2 W.	15 17.1 E.	19 15.4 E.
19 13.1 W.	20 14.0 W.	25 12.3 W.	May 5 12.4 E.	16 15.7 E.	20 14.0 E.
20 11.7 W.	21 12.6 W.	26 10.9 W.	6 11.0 E.	17 14.3 E.	21 12.6 E.
21 10.3 W.	22 11.2 W.	27 9.5 W.	7 9.6 E.	22 18.8 W.	22 11.3 E.
22 9.0 W.	23 9.8 W.	Apr. 2 12.5 E.	14 11.3 W.	23 17.4 W.	27 15.7 W.
26 14.8 E.	24 8.5 W.	3 11.1 E.	Oct. 15 14.7 E.	24 16.0 W.	28 14.3 W.
27 13.4 E.	29 12.9 E.	4 9.7 E.	20 19.2 W.	25 14.6 W.	29 12.9 W.
28 12.0 E.	Mar. 1 11.5 E.	5 8.3 E.	21 17.8 W.	26 13.2 W.	30 11.5 W.
29 10.6 E.	2 10.1 E.	10 12.7 W.	22 16.4 W.	30 19.1 E.	31 10.1 W.

ENCELADUS.

d h	d h	d h	d h	d h	d h
Jan. 2 8.6 E.	Jan. 16 1.4 E.	Jan. 29 18.1 E.	Feb. 12 10.8 E.	Feb. 26 3.6 E.	Mar. 10 20.4 E.
3 17.5 E.	17 10.3 E.	31 3.0 E.	13 19.7 E.	27 12.5 E.	12 5.3 E.
5 2.4 E.	18 19.2 E.	Feb. 1 11.8 E.	15 4.5 E.	28 21.3 E.	13 14.2 E.
6 11.3 E.	20 4.0 E.	2 20.7 E.	16 13.4 E.	Mar. 1 6.2 E.	14 23.1 E.
7 20.2 E.	21 12.9 E.	4 5.6 E.	17 22.3 E.	2 15.0 E.	16 8.0 E.
9 5.0 E.	22 21.7 E.	5 14.4 E.	19 7.1 E.	3 23.9 E.	17 16.8 E.
10 13.9 E.	24 6.6 E.	6 23.3 E.	20 16.0 E.	5 8.8 E.	19 1.7 E.
11 22.8 E.	25 15.5 E.	8 8.2 E.	22 0.9 E.	6 17.8 E.	20 10.6 E.
13 7.7 E	27 0.4 E.	9 17.1 E.	23 9.8 E.	8 2.7 E.	21 19.5 E.
14 16.6 E	28 9.3 E.	11 2.0 E.	24 18.7 E.	9 11.6 E.	23 4.4 E.

WASHINGTON MEAN TIMES OF GREATEST ELONGATIONS.

ENCELADUS—(*Concluded.*)

	d	h										
Mar.	24	13.3 E.	Apr.	14	2.6 E.	May	4	16.0 E.	Nov.	1	14.7 E.	Nov. 22	4.1 E.	Dec. 12	17.3 E.
	25	22.2 E.		15	11.5 E.		6	0.9 E.		2	23.6 E.	23	13.0 E.	14	2.2 E.
	27	7.1 E.		16	20.4 E.		7	9.8 E.		4	8.5 E.	24	21.9 E.	15	11.1 E.
	28	16.0 E.		18	5.3 E.		8	18.7 E.		5	17.4 E.	26	6.7 E.	16	19.9 E.
	30	0.8 E.		19	14.2 E.		10	3.6 E.		7	2.3 E.	27	15.6 E.	18	4.8 E.
	31	9.6 E.		20	23.1 E.	Oct.	18	21.9 E.		8	11.2 E.	29	0.5 E.	19	13.7 E.
Apr.	1	18.5 E.		22	8.0 E.		20	6.8 E.		9	20.1 E.	30	9.4 E.	20	22.6 E.
	3	3.4 E.		23	16.9 E.		21	15.7 E.		11	5.0 E.	Dec. 1	18.3 E.	22	7.5 E.
	4	12.3 E.		25	1.8 E.		23	0.5 E.		12	13.9 E.	3	3.1 E.	23	16.4 E.
	5	21.2 E.		26	10.7 E.		24	9.4 E.		13	22.8 E.	4	12.0 E.	25	1.3 E.
	7	6.1 E.		27	19.5 E.		25	18.3 E.		15	7.7 E.	5	20.9 E.	26	10.1 E.
	8	15.0 E.		29	4.4 E.		27	3.2 E.		16	16.6 E.	7	5.8 E.	27	19.0 E.
	9	23.9 E.		30	13.3 E.		28	12.1 E.		18	1.5 E.	8	14.7 E.	29	3.9 E.
	11	8.8 E.	May	1	22.2 E.		29	21.0 E.		19	10.3 E.	9	23.6 E.	30	12.7 E.
	12	17.7 E.		3	7.1 E.		31	5.9 E.		20	19.2 E.	11	8.5 E.	31	21.6 E.

TETHYS

	d	h										
Jan.	2	9.5 E.	Feb.	9	3.1 E.	Mar.	17	21.0 E.	Apr.	24	15.3 E.	Oct. 19	4.8 E.	Nov. 25	23.1 E.
	4	6.8 E.		11	0.4 E.		19	18.3 E.		26	12.6 E.	21	2.1 E.	27	20.4 E.
	6	4.1 E.		12	21.7 E.		21	15.6 E.		28	9.9 E.	22	23.4 E.	29	17.6 E.
	8	1.4 E.		14	19.0 E.		23	12.9 E.		30	7.2 E.	24	20.7 E.	Dec. 1	14.9 E.
	9	22.6 E.		16	16.3 E.		25	10.2 E.	May	2	4.6 E.	26	18.0 E.	3	12.2 E.
	11	19.9 E.		18	13.6 E.		27	7.5 E.		4	1.9 E.	28	15.3 E.	5	9.5 E.
	13	17.2 E.		20	10.9 E.		29	4.8 E.		5	23.2 E.	30	12.7 E.	7	6.9 E.
	15	14.5 E.		22	8.2 E.		31	2.1 E.		7	20.5 E.	Nov. 1	10.0 E.	9	4.2 E.
	17	11.7 E.		24	5.4 E.	Apr.	1	23.4 E.		9	17.8 E.	3	7.4 E.	11	1.5 E.
	19	9.0 E.		26	2.7 E.		3	20.7 E.		11	15.1 E.	5	4.7 E.	12	22.8 E.
	21	6.3 E.		28	0.0 E.		5	18.0 E.	Sept.	30	7.5 E.	7	2.1 E.	14	20.1 E.
	23	3.6 E.		29	21.3 E.		7	15.3 E.	Oct.	2	4.8 E.	8	23.4 E.	16	17.4 E.
	25	0.9 E.	Mar.	2	18.6 E.		9	12.7 E.		4	2.1 E.	10	20.7 E.	18	14.7 E.
	26	22.1 E.		4	15.9 E.		11	10.0 E.		5	23.4 E.	12	18.0 E.	20	12.0 E.
	28	19.4 E.		6	13.3 E.		13	7.3 E.		7	20.8 E.	14	15.3 E.	22	9.2 E.
	30	16.6 E.		8	10.6 E.		15	4.6 E.		9	18.1 E.	16	12.6 E.	24	6.5 E.
Feb.	1	13.9 E.		10	7.8 E.		17	2.0 E.		11	15.5 E.	18	9.9 E.	26	3.8 E.
	3	11.2 E.		12	5.1 E.		18	23.3 E.		13	12.8 E.	20	7.2 E.	28	1.1 E.
	5	8.5 E.		14	2.4 E.		20	20.6 E.		15	10.2 E.	22	4.6 E.	29	22.4 E.
	7	5.8 E.		15	23.7 E.		22	17.9 E.		17	7.5 E.	24	1.9 E.	31	19.7 E.

DIONE.

	d	h										
Jan.	1	5.3 E.	Feb.	3	1.0 E.	Mar.	6	20.9 E.	Apr.	8	17.0 E.	Oct. 28	9.9 E.	Nov. 30	6.2 E.
	3	22.9 E.		5	18.7 E.		9	14.6 E.		11	10.7 E.	31	3.6 E.	Dec. 2	23.9 E.
	6	16.6 E.		8	12.3 E.		12	8.2 E.		14	4.4 E.	Nov. 2	21.3 E.	5	17.5 E.
	9	10.3 E.		11	5.9 E.		15	1.9 E.		16	22.1 E.	5	15.0 E.	8	11.2 E.
	12	3.9 E.		13	23.5 E.		17	19.5 E.		19	15.8 E.	8	8.7 E.	11	4.8 E.
	14	21.6 E.		16	17.2 E.		20	13.2 E.		22	9.5 E.	11	2.4 E.	13	22.5 E.
	17	15.2 E.		19	10.8 E.		23	6.8 E.		25	3.2 E.	13	20.1 E.	16	16.1 E.
	20	8.9 E.		22	4.5 E.		26	0.5 E.		27	20.9 E.	16	13.7 E.	19	9.8 E.
	23	2.5 E.		24	22.1 E.		28	18.2 E.		30	14.6 E.	19	7.4 E.	22	3.5 E.
	25	20.1 E.		27	15.8 E.		31	11.9 E.	May	3	8.3 E.	22	1.1 E.	24	21.2 E.
	28	13.7 E.	Mar.	1	9.5 E.	Apr.	3	5.5 E.		6	2.0 E.	24	18.8 E.	27	14.9 E.
	31	7.4 E.		4	3.2 E.		5	23.2 E.		8	19.7 E.	27	12.5 E.	30	8.6 E.

RHEA.				TITAN.				HYPERION.			
d	h	d	h	d	h	d	h	d	h	d	h
Jan. 2	7.6 E.	Apr. 19	15.8 E.	Jan. 3	14 W.	Apr. 7	23 W.	Jan. 2	15 E.	May 8	23 E.
6	19.9 E.	24	4.3 E.	7	13 S.	11	23 S.	7	22 I.	14	9 I.
11	8.2 E.	28	16.8 E.	11	12 E.	15	23 E.	13	5 W.	19	17 W.
15	20.4 E.	May 3	5.3 E.	15	11 I.	19	22 I.	18	12 S.	25	1 S.
20	8.7 E.	7	17.8 E.	19	11 W.	23	22 W.	23	19 E.	30	10 E.
24	21.0 E.	Oct. 8	14.1 E.	23	10 S.	Oct. 25	7 E.	29	2 I.	Oct. 11	9 I.
29	9.3 E.	13	2.6 E.	27	9 E.	29	6 I.	Feb. 3	9 W.	16	17 W.
Feb. 2	21.6 E.	17	15.2 E.	31	9 I.	Nov. 2	6 W.	8	16 S.	22	2 S.
7	9.9 E.	22	3.7 E.	Feb. 4	8 W.	6	6 S.	13	22 E.	27	10 E.
11	22.1 E.	26	16.2 E.	8	7 S.	10	6 E.	19	5 I.	Nov. 1	18 I.
16	10.4 E.	31	4.7 E.	12	7 E.	14	5 I.	24	12 W.	7	3 W.
20	22.7 E.	Nov. 4	17.2 E.	16	6 I.	18	5 W.	29	19 S.	12	11 S.
25	11.0 E.	9	5.6 E.	20	5 W.	22	5 S.	Mar. 6	3 E.	17	19 E.
29	23.3 E.	13	18.1 E.	24	4 S.	26	5 E.	11	10 I.	23	2 I.
Mar. 5	11.7 E.	18	6.5 E.	28	4 E.	30	4 I.	16	18 W.	28	10 W.
10	0.1 E.	22	18.9 E.	Mar. 3	3 I.	Dec. 4	4 W.	22	1 S.	Dec. 3	18 S.
14	12.5 E.	27	7.3 E.	7	2 W.	8	3 S.	27	8 E.	9	0 E.
19	0.9 E.	Dec. 1	19.7 E.	11	1 S.	12	3 E.	Apr. 1	16 I.	14	7 I.
23	13.2 E.	6	8.1 E.	15	1 E.	16	2 I.	7	0 W.	19	15 W.
28	1.6 E.	10	20.4 E.	19	0 I.	20	2 W.	12	8 S.	24	22 S.
Apr. 1	14.0 E.	15	8.8 E.	23	0 W.	24	2 S.	17	15 E.	30	5 E.
6	2.4 E.	19	21.1 E.	26	23 S.	28	1 E.	23	0 I.		
10	14.8 E.	24	9.4 E.	30	23 E.	32	0 I.	28	8 W.	1889	
15	3.3 E.	28	21.8 E.	Apr. 3	23 I.	36	0 W.	May 3	15 S.	Jan. 4	12 I.

JAPETUS						
West Elongation . .	January 13	March 31	June 20	September 9	November 29
Superior Conjunction .	February 2	April 20	July 10	September 30	December 19
East Elongation . .	February 21	May 10	July 31	October 20	
Inferior Conjunction .	March 12	May 31	August 20	November 9	

THE APPARENT ELEMENTS OF SATURN'S RINGS.

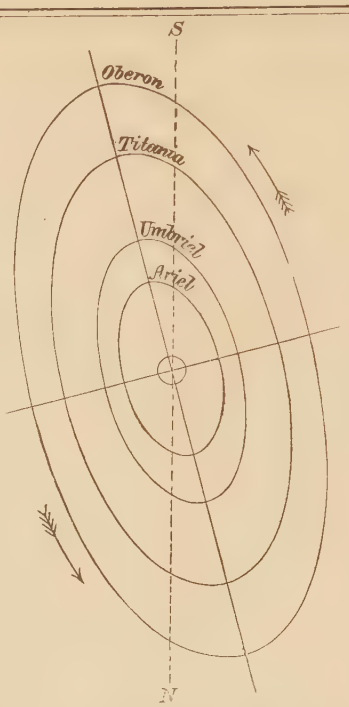
Greenwich Mean Noon.		*a* Outer Major Axis.	*b* Outer Minor Axis.	*p* Inclination of Northern Semi-Minor Axis to Circle of Declination from North to East.	*l* The Elevation of the Earth above the Plane of the Ring.	*l'* The Elevation of the Sun above the Plane of the Ring.	*u* Earth's Longitude from Saturn counted on Plane of Ring from the Ring's Ascending Node on Equator.	*u'* Ecliptic.
Jan.	0	45".80	15".10	— 7° 25'.7	— 19° 15'.4	— 20° 9'.9	183° 12'.4	140° 37'.3
	20	46.26	15.71	7 27.3	19 51.1	19 56.1	181 41.2	139 6.2
Feb.	9	46.01	16.08	7 28.7	20 27.2	19 42.1	180 5.8	137 30.8
	29	45.11	16.12	7 29.5	20 56.0	19 28.0	178 47.7	136 12.8
Mar.	20	43.76	15.83	7 29.9	21 12.1	19 13.7	178 3.6	135 28.8
Apr.	9	42.23	15.28	— 7 29.9	— 21 13.2	— 18 59.2	178 2.3	135 27.6
	29	40.71	14.58	7 29.7	20 59.5	18 44.6	178 44.4	136 9.8
May	19	39.36	13.81	7 28.8	20 32.2	18 29.8	180 4.6	137 30.1
June	8	38.28	13.03	7 27.3	19 53.6	18 14.8	181 55.1	139 20.7
	28	37.52	12.28	7 25.0	19 5.8	17 59.8	184 7.3	141 32.9
July	18	37.09	11.58	— 7 21.6	— 18 11.4	— 17 44.5	186 32.2	143 57.9
Aug.	7	37.01	10.96	7 17.3	17 13.3	17 29.1	189 1.5	146 27.3
	27	37.27	10.43	7 12.3	16 14.6	17 13.6	191 27.4	148 53.3
Sept.	16	37.89	10.01	7 7.0	15 19.3	16 57.9	193 41.6	151 7.6
Oct.	6	38.84	9.74	7 2.0	14 31.4	16 42.0	195 36.5	153 2.6
	26	40.08	9.64	— 6 57.9	— 13 55.5	— 16 26.1	197 3.8	154 30.0
Nov.	15	41.53	9.76	6 55.4	13 35.2	16 10.1	197 56.6	155 22.8
Dec.	5	43.06	10.10	6 54.9	13 33.4	15 53.9	198 9.3	155 35.6
	25	44.45	10.64	6 56.5	13 50.9	15 37.5	197 41.0	155 7.4
	31	44.81	10.83	— 6 57.3	— 13 59 4	— 15 32.7	197 25.2	154 51.6

The factor to be multiplied by *a* and *b* to obtain the axes of—

The inner ellipse of the outer ring	= 0.8801	log factor = 9.9445
The outer ellipse of the inner ring	= 0.8599	log factor = 9.9344
The inner ellipse of the inner ring	= 0.6650	log factor = 9.8228
The inner ellipse of the dusky ring	= 0.5486	log factor = 9.7392

NOTE.—The negative sign of *l* indicates that the visible surface of the ring is the southern one.

Date.	Position Angle.	App. Distances. Ariel.	Umbriel.
	°	″	″
Feb. 1,	14.3	14.7	20.5
Apr. 1,	14.2	15.2	21.2
June 1,	14.1	14.8	20.7



Date.	Position Angle.	App. Distances. Titania.	Oberon.
	°	″	″
Feb. 1,	14.3	33.6	45.0
Apr. 1,	14.2	34.8	46.5
June 1,	14.1	33.9	45.3

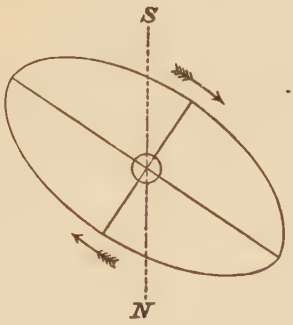
APPARENT ORBITS OF THE SATELLITES OF URANUS IN 1888, AS SEEN IN AN INVERTING TELESCOPE.

WASHINGTON MEAN TIMES OF GREATEST ELONGATIONS.

ARIEL.				UMBRIEL.				TITANIA.				OBERON.
North.		South.		North.		South.		North.		South.		North and South.
d	h	d	h	d	h	d	h	d	h	d	h	d h
Jan. 1	8.8	Jan. 2	15.1	Jan. 3	0.9	Jan. 5	2.6	Jan. 3	3.4	Jan. 7	11.9	Jan. 3 13.4 S.
8	22.3	10	4.5	11	7.8	13	9.5	11	20.4	16	4.8	10 7.0 N.
16	11.7	17	18.0	19	14.7	21	16.4	20	13.3	24	21.7	17 0.5 S.
24	1.2	25	7.4	27	21.6	29	23.3	29	6.2	Feb. 2	14.6	23 18.0 N.
31	14.7	Feb. 1	20.9	Feb. 5	4.5	Feb. 7	6.2	Feb. 6	23.1	11	7.6	30 11.6 S.
Feb. 8	4.1	9	10.3	13	11.4	15	13.1	15	16.0	20	0.5	Feb. 6 5.1 N.
15	17.5	16	23.8	21	18.3	23	20.0	24	8.9	28	17.4	12 22.6 S.
23	7.0	24	13.2	Mar. 1	1.2	Mar. 3	2.9	Mar. 4	1.8	Mar. 8	10.3	19 16.1 N.
Mar. 1	20.4	Mar. 3	2.7	9	8.1	11	9.8	12	18.7	17	3.2	26 9.7 S.
9	9.9	10	16.1	17	15.0	19	16.7	21	11.7	25	20.1	Mar. 4 3.2 N.
16	23.5	18	5.6	25	21.9	27	23.6	30	4.6	Apr. 3	13.1	10 20.8 S.
24	12.8	25	19.1	Apr. 3	4.8	Apr. 5	6.5	Apr. 7	21.5	12	6.0	17 14.3 N.
Apr. 1	2.3	Apr. 2	8.5	11	11.7	13	13.4	16	14.4	20	22.9	24 7.9 S.
8	15.7	9	22.0	19	18.6	21	20.4	25	7.4	29	15.8	31 1.4 N.
16	5.2	17	11.4	28	1.6	30	3.3	May 4	0.3	May 8	8.8	Apr. 6 18.9 S.
23	18.7	25	0.9	May 6	8.5	May 8	10.2	12	17.3	17	1.7	13 12.5 N.
May 1	8.1	May 2	14.3	14	15.4	16	17.1	21	10.2	25	18.7	20 6.0 S.
8	21.6	10	3.8	22	22.3	25	0.1	30	3.1	June 3	11.6	26 23.6 N.
16	11.1	17	17.3	31	5.3	June 2	7.0	June 7	20.1	12	4.6	May 3 17.1 S.
24	0.5	25	6.8	June 8	12.2	10	13.9	16	13.0	20	21.5	10 10.7 N.
31	14.0	June 1	20.3	16	19.1	18	20.9	25	6.0	29	14.4	17 4.2 S.
June 8	3.5	9	9.7	25	2.1	27	3.8	July 3	22.9	July 8	7.4	23 21.8 N.
15	17.0	16	23.2	July 3	9.0	July 5	10.7	12	15.9	17	0.3	30 15.3 S.
23	6.5	24	12.7									June 6 8.9 N.
30	19.9	July 2	2.2									13 2.4 S.

	d	h		d	h
Period of Ariel,	2	12.489	Period of Titania,	8	16.942
Period of Umbriel,	4	3.460	Period of Oberon,	13	11.119

NOTE.—For Ariel only every third elongation is given, and for Umbriel every alternate one. The intermediate ones may be found by adding multiples of the period of the satellite.



Date	Position Angle.	Apparent Distance.
	°	″
Jan. 14.	234.7	16.7
Sept. 14.	237.1	16.6
Nov. 17,	236.8	17.0

APPARENT ORBIT OF THE SATELLITE OF NEPTUNE IN 1888, *AS SEEN IN AN INVERTING TELESCOPE.*

WASHINGTON MEAN TIMES OF GREATEST ELONGATIONS.

South West.		North East.		South West.		North East.		South West.		North East.	
	d h		d h		d h		d h		d h		d h
Jan.	2 0.9	Jan.	4 23.4	Aug.	29 23.3	Sept.	1 21.8	Nov.	2 14.5	Nov.	5 13.0
	7 22.0		10 20.5	Sept.	4 20.3		7 18.8		8 11.5		11 10.0
	13 19.0		16 17.5		10 17.3		13 15.8		14 8.5		17 7.1
	19 16.1		22 14.6		16 14.3		19 12.8		20 5.6		23 4.1
	25 13.1		28 11.6		22 11.4		25 9.9		26 2.6		29 1.1
	31 10.1	Feb.	3 8.7		28 8.4	Oct.	1 6.9	Dec.	1 23.6	Dec.	4 22.2
Feb.	6 7.2		9 5.7	Oct.	4 5.4		7 3.9		7 20.7		10 19.2
	12 4.2		15 2.8		10 2.4		13 0.9		13 17.7		16 16.2
	18 1.3		20 23.8		15 23.4		18 21.9		19 14.7		22 13.2
	23 22.3		26 20.8		21 20.4		24 19.0		25 11.7		28 10.2
	29 19.4	Mar.	3 17.9		27 17.5		30 16.0		31 8.8		34 7.3

The above times are those of each passage of the satellite through an apsis of its apparent orbit. The position of the satellite at any other time may be found by measuring around the orbit from the apsis last passed through, remembering that the radius vector of the satellite describes equal areas in equal times.

Period of the satellite of Neptune, $5^{d}\ 21^{h}.045$.

In the above diagrams, the central circle represents the planet, and is on the same scale as the orbits.

WASHINGTON MEAN TIME.

PLANETARY CONSTELLATIONS.

	d	h	m								°	′
Jan.	1	23	–	☌	♅	♀	. . . . .	♅	—		1	51
	2	18	–			♀	greatest Hel. Lat. N.					
	3	8	–			☿	in Aphelion.					
	4	19	–	□	♂	☉						
	5	15	46	☌	♂	☽	. . . . .	♂	—		2	46
	5	18	22	☌	♁	☽	. . . . .	♁	—		4	27
	7	7	–	□	♁	☉						
	8	18	10	☌	♅	☽	. . . . .	♅	—		4	12
	9	2	–	☌	♁	♂	. . . . .	♁	—		1	40
	9	6	36	☌	♀	☽	. . . . .	♀	—		2	16
	12	10	36	☌	☿	☽	. . . . .	☿	—		3	49
	18	3	–	☌	♀	☉	Superior.					
	21	3	–			♁	Stationary.					
	22	15	43	☌	♆	☽	. . . . .	♆	+		3	26
	22	21	–	☍	♄	☉						
	23	16	–			☿	greatest Hel. Lat. S.					
	24	6	–	☌	♅	β^1	Scorpii . . .	*	+		0	8
	27	20	20	☌	♄	☽	. . . . .	♄	+		1	10
	28	–	–			☽	eclipsed, vis. at Wash.					
Feb.	1	23	47	☌	♁	☽	. . . . .	♁	—		4	29
	2	14	47	☌	♂	☽	. . . . .	♂	—		2	51
	5	7	27	☌	♅	☽	. . . . .	♅	—		4	2
	6	2	–			♆	Stationary.					
	8	3	43	☌	♀	☽	. . . . .	♀	—		1	24
	11	–	–			☉	eclipsed, invis. at Wash.					
	11	17	–			☿	in ♌					
	12	16	11	☌	☿	☽	. . . . .	☿	+		3	9
	15	19	–	□	♆	☉						
	16	7	–			☿	in Perihelion.					
	16	15	–			☿	greatest elong. E.	18			7	
	19	0	6	☌	♆	☽	. . . . .	♆	+		3	25
	23	2	–			☿	Stationary.					
	23	17	–	□	♅	☉						
	24	2	57	☌	♄	☽	. . . . .	♄	+		1	22
	26	15	–			☿	greatest Hel. Lat. N.					
	27	20	–			♀	in ♍					
	29	6	23	☌	♁	☽	. . . . .	♁	—		4	22
Mar.	1	5	45	☌	♂	☽	. . . . .	♂	—		2	36
	3	2	–	☌	☿	☉	Inferior.					
	3	17	28	☌	♅	☽	. . . . .	♅	—		3	47
	3	18	–			♂	Stationary.					
	9	4	28	☌	♀	☽	. . . . .	♀	+		0	18
	10	13	8	☌	☿	☽	. . . . .	☿	+		5	8
	16	13	–			☿	Stationary.					
	17	8	28	☌	♆	☽	. . . . .	♆	+		3	17
	19	11	–			☉	enters ♈, Spring com.					
	21	2	–			☿	in ♍					
	21	14	–			♅	Stationary.					
	22	10	46	☌	♄	☽	. . . . .	♄	+		1	20
	27	8	–	☌	☿	♀	. . . . .	☿	+		0	2
	27	14	50	☌	♁	☽	. . . . .	♁	—		4	16
	28	9	7	☌	♂	☽	. . . . .	♂	—		2	35
	30	9	–			☿	greatest elong. W.	27			49	
Mar.	30	10	–			♄	Stationary.					
	31	1	28	☌	♅	☽	. . . . .	♅	—		3	32
	31	7	–			☿	in Aphelion.					
Apr.	2	4	–			♀	in Aphelion.					
	3	20	–	☍	♁	☉						
	8	5	58	☌	☿	☽	. . . . .	☿	+		1	16
	8	8	8	☌	♀	☽	. . . . .	♀	+		2	23
	10	13	–	☍	♂	☉						
	13	12	–	☌	☿	♀	. . . . .	☿	—		1	10
	13	16	32	☌	♆	☾	. . . . .	♆	+		3	5
	18	16	–	□	♄	☉						
	18	19	21	☌	♄	☽	. . . . .	♄	+		1	5
	20	15	–			☿	greatest Hel. Lat. S.					
	23	23	57	☌	♁	☽	. . . . .	♁	—		4	17
	24	4	25	☌	♂	☽	. . . . .	♂	—		3	16
	24	16	–			♀	greatest Hel. Lat. S.					
	27	8	8	☌	♅	☽	. . . . .	♅	—		3	26
May	5	1	–	☌	♁	♂	. . . . .	♁	—		0	34
	8	15	45	☌	♀	☽	. . . . .	♀	+		3	50
	9	16	–			☿	in ♌					
	10	5	3	☌	☿	☽	. . . . .	☿	+		5	6
	10	7	–	☌	☿	☉	Superior.					
	11	0	30	☌	♆	☽	. . . . .	♆	+		2	59
	14	6	–			☿	in Perihelion.					
	14	15	–	☌	♆	☿	. . . . .	♆	—		2	32
	16	2	28	☌	♄	☽	. . . . .	♄	+		0	43
	19	17	–	☌	♆	☉						
	20	10	–	☌	♅	β^1	Scorpii . . .	*	+		0	2
	21	5	42	☌	♂	☽	. . . . .	♂	—		4	32
	21	8	18	☌	♁	☽	. . . . .	♁	—		4	25
	21	12	–	☍	♅	☉						
	21	13	–			♂	Stationary.					
	24	13	41	☌	♅	☽	. . . . .	♅	—		3	34
	24	15	–			☿	greatest Hel. Lat. N.					
	31	20	–	☌	♆	♀	. . . . .	♆	—		0	54
June	5	2	–			♂	in ♍					
	6	12	–	☌	♁	♂	. . . . .	♁	+		0	47
	7	8	48	☌	♆	☽	. . . . .	♆	+		2	57
	8	2	44	☌	♀	☽	. . . . .	♀	+		3	39
	11	3	55	☌	☿	☽	. . . . .	☿	+		2	29
	12	3	–			☿	greatest elong. E.	24			24	
	12	14	40	☌	♄	☽	. . . . .	♄	+		0	20
	17	1	–			☿	in ♍					
	17	15	11	☌	♁	☽	. . . . .	♁	—		4	36
	17	19	43	☌	♂	☽	. . . . .	♂	—		5	47
	19	14	–			♁	Stationary.					
	19	23	–			♀	in ♌					
	20	7	–			☉	enters ♋, Summer com.					
	20	18	27	☌	♅	☽	. . . . .	♅	—		3	51
	25	6	–			☿	Stationary.					
	27	6	–			☿	in Aphelion.					
July	3	2	–			☉	Apogee.					

WASHINGTON MEAN TIME.

PLANETARY CONSTELLATIONS.

	d	h	m		° ′
July	4	4	–	☐ ♃ ☉	
	4	17	34	♂ ♆ ☽ . . . . . ♆ +	2 58
	8	–	–	☉ eclipsed, invis. at Wash.	
	8	12	–	♂ ☿ ☉ Inferior.	
	8	12	–	♂ ☿ ♀ . . . . . ☿ —	5 32
	8	12	9	♂ ♀ ☽ . . . . . ♀ +	1 57
	8	12	14	♂ ☿ ☽ . . . . . ☿ +	3 35
	10	2	36	♂ ♄ ☽ . . . . . ♄ +	0 1
	11	2	–	♂ ♀ ☉ Superior.	
	14	21	18	♂ ♃ ☽ . . . . . ♃ —	4 40
	15	19	59	♂ ♂ ☽ . . . . . ♂ —	6 40
	17	15	–	☿ greatest Hel. Lat. S.	
	17	23	30	♂ ♅ ☽ . . . . . ♅ —	4 5
	19	3	–	☿ Stationary.	
	22	–	–	☽ eclipsed, vis. at Wash.	
	22	2	–	☐ ♂ ☉	
	22	22	–	♅ Stationary.	
	23	11	–	♀ in Perihelion.	
	26	20	–	♂ ♄ ♀ . . . . . ♄ —	0 35
	28	14	–	☿ greatest elong. W.	19 31
Aug.	1	2	39	♂ ♆ ☽ . . . . . ♆ +	2 56
	1	8	–	♂ ♄ ☉	
	5	15	43	♂ ☿ ☽ . . . . . ☿ +	0 18
	5	16	–	☿ in ♌	
	6	16	21	♂ ♄ ☽ . . . . . ♄ —	0 16
	7	–	–	☉ eclipsed, invis. at Wash.	
	7	15	32	♂ ♀ ☽ . . . . . ♀ —	0 42
	10	6	–	☿ in Perihelion.	
	11	4	22	♂ ♃ ☽ . . . . . ♃ —	4 44
	13	3	32	♂ ♂ ☽ . . . . . ♂ —	6 50
	13	11	–	♂ ☿ ♄ . . . . . ☿ +	0 39
	14	6	27	♂ ♅ ☽ . . . . . ♅ —	4 8
	14	11	–	♀ greatest Hel. Lat. N.	
	19	15	–	☐ ♅ ☉	
	20	14	–	☿ greatest Hel. Lat. N.	
	23	8	–	♂ ☿ ☉ Superior.	
	24	10	–	☐ ♆ ☉	
	28	11	23	♂ ♆ ☽ . . . . . ♆ +	2 47
Sept.	3	7	24	♂ ♄ ☽ . . . . . ♄ —	0 34
	3	19	–	♆ Stationary.	
	6	6	59	♂ ☿ ☽ . . . . . ☿ —	3 46
	6	13	44	♂ ♀ ☽ . . . . . ♀ —	3 32
	7	13	47	♂ ♃ ☽ . . . . . ♃ —	4 41
	10	16	40	♂ ♂ ☽ . . . . . ♂ —	6 7
	10	16	50	♂ ♅ ☽ . . . . . ♅ —	3 56
	10	21	–	♂ ♂ ♅ . . . . . ♂ —	2 12
	13	0	–	☿ in ♍	
	18	10	–	♂ ☿ ♀ . . . . . ☿ —	1 39
	19	0	–	♂ ♃ ☿ . . . . . ♃ +	1 28
	19	3	–	♂ ♃ ♀ . . . . . ♃ —	0 14
	21	22	–	☉ enters ♎, Autumn com.	
	22	2	–	♂ ☿ α Virginis . . * —	0 55
	22	8	–	♂ ♅ β Scorpii . . . * +	0 28
Sept.	23	5	–	☿ in Aphelion.	
	24	18	57	♂ ♆ ☽ . . . . . ♆ +	2 34
	30	22	16	♂ ♄ ☽ . . . . . ♄ —	0 56
Oct.	5	1	56	♂ ♃ ☽ . . . . . ♃ —	4 40
	6	10	43	♂ ♀ ☽ . . . . . ♀ —	5 7
	6	12	0	♂ ☿ ☽ . . . . . ☿ —	8 9
	7	23	–	☿ greatest elong. E.	25 14
	8	7	31	♂ ♅ ☽ . . . . . ♅ —	3 33
	9	6	–	♂ ☿ ♀ . . . . . ☿ —	3 9
	9	10	9	♂ ♂ ☽ . . . . . ♂ —	4 38
	9	12	–	♀ in ♍	
	9	20	–	♂ ♃ ☉	
	13	14	–	☿ greatest Hel. Lat. S.	
	19	19	–	☿ Stationary.	
	22	0	57	♂ ♆ ☽ . . . . . ♆ +	2 23
	28	11	3	♂ ♄ ☽ . . . . . ♄ —	1 17
	31	7	–	♂ ☿ ☉ Inferior.	
Nov.	1	15	–	☿ in ♌	
	1	15	33	♂ ♃ ☽ . . . . . ♃ —	4 44
	2	18	43	♂ ☿ ☽ . . . . . ☿ —	4 50
	5	2	13	♂ ♅ ☽ . . . . . ♅ —	3 6
	5	9	26	♂ ♀ ☽ . . . . . ♀ —	4 28
	6	5	–	☿ in Perihelion.	
	7	6	44	♂ ♂ ☽ . . . . . ♂ —	2 35
	8	3	–	☿ Stationary.	
	8	20	–	♂ greatest Hel. Lat. S.	
	11	6	–	☐ ♄ ☉	
	12	21	–	♀ in Aphelion.	
	16	13	–	☿ greatest Hel. Lat. N.	
	16	13	–	☿ greatest elong. W.	19 34
	18	5	48	♂ ♆ ☽ . . . . . ♆ +	2 20
	22	1	–	♂ ♆ ☉	
	24	19	57	♂ ♄ ☽ . . . . . ♄ —	1 31
	29	4	29	♂ ♃ ☽ . . . . . ♃ —	4 53
	30	4	–	♄ Stationary.	
Dec.	1	15	37	♂ ☿ ☽ . . . . . ☿ —	3 24
	2	23	30	♂ ♅ ☽ . . . . . ♅ —	2 38
	3	1	–	♂ in Perihelion.	
	5	8	46	♂ ♀ ☽ . . . . . ♀ —	2 4
	5	9	–	♀ greatest Hel. Lat. S.	
	6	5	14	♂ ♂ ☽ . . . . . ♂ —	0 15
	8	6	–	♂ ♅ ☉	
	10	0	–	☿ in ♍	
	15	10	25	♂ ♆ ☽ . . . . . ♆ +	2 26
	16	13	–	♂ ☿ ♅ . . . . . ☿ —	1 8
	20	5	–	☿ in Aphelion.	
	20	16	–	☉ enters ♑, Winter com.	
	22	0	56	♂ ♄ ☽ . . . . . ♄ —	1 32
	26	14	30	♂ ♃ ☽ . . . . . ♃ —	5 1
	28	2	–	♂ ☿ ☉ Superior.	
	30	20	57	♂ ♅ ☽ . . . . . ♅ —	2 11
	31	2	–	☉ Perigee.	

POSITIONS OF OBSERVATORIES.

(North Latitudes and West Longitudes are Considered Positive.)

Place.	Latitude.	Reduction to Geocentric Latitude.	Log ρ.	Longitude	
				From Washington.	From Greenwich.
	° ′ ″	′ ″		h m s	h m s
Åbo	+ 60 26 56.8	— 9 53.5	9.998902	— 6 37 18.50	— 1 29 6.41
Adelaide	— 34 55 33.8	+ 10 47.6	9.999527	— 14 22 32.34	— 9 14 20.30
Albany	+ 42 39 49.5	— 11 28.2	9.999336	— 0 13 12.87	+ 4 54 59.22
Alfred (N. Y.)	+ 42 15 19.8	— 11 27.2	9.999346	+ 0 2 55.00	+ 5 11 7.09
Algier	+ 36 45 2.7	— 11 1.6	9.999483	— 5 20 23.48	— 0 12 11.39
Allegheny	+ 40 27 41.6	— 11 21.6	9.999391	+ 0 11 50.84	+ 5 20 2.93
Altona	+ 53 32 45.3	— 11 0.8	9.999063	— 5 47 58.44	— 0 39 46.35
Amherst	+ 42 22 15.6	— 11 27.5	9.999343	— 0 18 7.37	+ 4 50 04.67
Annapolis	+ 38 58 53.5	— 11 15.0	9.999428	— 0 2 15.60	+ 5 5 56.49
Ann Arbor	+ 42 16 48.0	— 11 27.3	9.999346	+ 0 26 43.10	+ 5 34 55.19
Armagh	+ 54 21 12.7	— 10 54.9	9.999043	— 4 41 36.6	+ 0 26 35.5
Athens	+ 37 58 20.0	— 11 9.4	9.999453	— 6 43 7.8	— 1 34 55.7
Berlin	+ 52 30 16.7	— 11 7.7	9.999088	— 6 1 47.00	— 0 53 34.91
Berne	+ 46 57 8.7	— 11 29.2	9.999227	— 5 37 58.1	— 0 29 46.0
Bethlehem	+ 40 36 23.9	— 11 22.2	9.999368	— 0 6 40.19	+ 5 1 31.90
Birr Castle	+ 53 5 47.0	— 11 3.9	9.999074	— 4 36 31.2	+ 0 31 40.9
Bologna	+ 44 29 47.0	— 11 30.5	9.999289	— 5 53 36.7	— 0 45 24.6
Bonn	+ 50 43 45.0	— 11 17.3	9.999132	— 5 36 35.38	— 0 28 23.29
Bothkamp	+ 54 12 9.6	— 10 56.0	9.999047	— 5 48 42.9	— 0 40 30.8
Breslau	+ 51 6 56.5	— 11 15.4	9.999122	— 6 16 20.80	— 1 8 8.71
Brussels	+ 50 51 10.5	— 11 16.8	9.999129	— 5 25 40.7	— 0 17 28.6
Cambridge (*England*)	+ 52 12 51.6	— 11 9.4	9.999095	— 5 8 34.84	— 0 0 22.75
Cambridge (*Mass.*)	+ 42 22 48.3	— 11 27.6	9.999343	— 0 23 41.11	+ 4 44 30.98
Cape of Good Hope	— 33 56 3.4	+ 10 39.0	9.999550	— 6 22 7.1	— 1 13 55.0
Chapultepec	+ 19 25 17.5	— 7 12.0	9.999841	+ 1 28 26.15	+ 6 36 38.24
Charkow	+ 50 0 10.2	— 11 20.5	9.999150	— 7 33 6.8	— 2 24 54.7
Chicago	+ 41 50 1.0	— 11 26.2	9.999357	+ 0 42 14.69	+ 5 50 26.78
Christiania	+ 59 54 43.7	— 10 0.2	9.998914	— 5 51 5.94	— 0 42 53.85
Cincinnati (*New Obs.*)	+ 39 8 19.5	— 11 15.8	9.999424	+ 0 29 29.20	+ 5 37 41.29
Cincinnati (*Old Obs.*)	+ 39 6 26.5	— 11 15.6	9.999425	+ 0 29 46.85	+ 5 37 58.94
Clinton	+ 43 3 17.0	— 11 28.9	9.999326	— 0 6 34.65	+ 5 1 37.44
Coimbra	+ 40 12 25.8	— 11 20.6	9.999398	— 4 34 37.6	+ 0 33 34.5
Copenhagen	+ 55 41 13.6	— 10 43.9	9.999011	— 5 58 31.3	— 0 50 19.2
Cordoba	— 31 25 15.4	+ 10 13.5	9.999608	— 0 51 27.0	+ 4 16 45.1
Cracow	+ 50 3 50.0	— 11 20.3	9.999149	— 6 28 2.46	— 1 19 50.37
Dantzig	+ 54 21 18.0	— 10 54.9	9.999043	— 6 22 51.4	— 1 14 39.3
Dorpat	+ 58 22 47.4	— 10 17.6	9.998948	— 6 55 5.6	— 1 46 53 5
Dresden	+ 51 2 16.8	— 11 15.8	9.999124	— 6 3 6.93	— 0 54 54.84
Dublin	+ 53 23 13	— 11 1.9	9.999066	— 4 42 50	+ 0 25 22
Düsseldorf	+ 51 12 25	— 11 15.0	9.999120	— 5 35 17	— 0 27 5
Dun Echt	+ 57 9 36	— 10 30.2	9.998977	— 4 58 32.1	+ 0 9 40.0
Durham	+ 54 46 6.2	— 10 51.6	9.999033	— 5 1 52.3	+ 0 6 19.8
Edinburgh	+ 55 57 23.2	— 10 41.5	9.999005	— 4 55 29.04	+ 0 12 43.05
Florence	+ 43 46 4.1	— 11 29.9	9.999308	— 5 53 13.6	— 0 45 1.5
Geneva	+ 46 11 58.8	— 11 30.1	9.999246	— 5 32 48.86	— 0 24 36.77
Georgetown	+ 38 54 26.2	— 11 14.6	9.999430	+ 0 0 6.20	+ 5 8 18.29
Glasgow (*Missouri*)	+ 39 13 45.6	— 11 16.2	9.999422	+ 1 3 5.93	+ 6 11 18.02

POSITIONS OF OBSERVATORIES.

(*North Latitudes and West Longitudes are Considered Positive.*)

Place.	Latitude.	Reduction to Geocentric Latitude.	Log ρ.	Longitude	
				From Washington.	From Greenwich.
	° ′ ″	′ ″		h m s	h m s
Glasgow (*Scotland*)	+55 52 42.8	− 10 42.2	9.999006	− 4 51 1.5	+ 0 17 10.6
Göttingen	+51 31 47.9	− 11 13.3	9.999112	− 5 47 58.33	− 0 39 46.24
Gotha	+50 56 37.5	− 11 16.3	9.999127	− 5 51 2.62	− 0 42 50.53
Greenwich	+51 28 38.4	− 11 13.6	9.999113	− 5 8 12.09	0 0 0
Hamburg	+53 33 7.0	− 11 0.8	9.999062	− 5 48 5.8	− 0 39 53.7
Hanover	+43 42 15	− 11 29.8	9 999309	− 0 19 4.13	+ 4 49 7.96
Hastings-on-Hudson	+40 59 25	− 11 23.6	9.999378	− 0 12 42.4	+ 4 55 29.7
Haverford	+40 0 40.1	− 11 19.8	9.999402	− 0 6 59.34	+ 5 1 12.75
Helsingfors	+60 9 43.3	− 9 57.1	9.998909	− 6 48 1.25	− 1 39 49.16
Hudson	+41 14 42.6	− 11 24.4	9.999371	+ 0 17 32.06	+ 5 25 44.15
Karlsruhe	+49 0 29.6	− 11 24.2	9.999175	− 5 41 48.60	− 0 33 36.51
Kasan	+55 47 24.2	− 10 43.0	9.999009	− 8 24 41.0	− 3 16 28.9
Kew	+51 28 6	− 11 13.6	9.999114	− 5 6 57.0	+ 0 1 15.1
Kiel	+54 20 29.7	− 10 55.0	9.999043	− 5 48 47.85	− 0 40 35.76
Kiew	+50 27 11.1	− 11 18.6	9.999139	− 7 10 12.73	− 2 2 0.64
Königsberg	+54 42 50.6	− 10 52.0	9.999034	− 6 30 11.00	− 1 21 58.91
Kremsmünster	+48 3 23.7	− 11 27.0	9.999199	− 6 4 44.3	− 0 56 32.2
Leiden	+52 9 20.0	− 11 9.8	9.999097	− 5 26 8.44	− 0 17 56.35
Leipzig	+51 20 6.3	− 11 14.3	9.999117	− 5 57 46.11	− 0 49 34.02
Leyton	+51 34 34	− 11 13.0	9.999111	− 5 8 11.22	+ 0 0 0.87
Lisbon (*Marine Obs.*)	+38 42 17.6	− 11 13.5	9.999435	− 4 31 47.1	+ 0 36 25.0
Lisbon (*Royal Obs.*)	+38 42 31.3	− 11 13.6	9.999435	− 4 31 27.41	+ 0 36 44.68
Liverpool	+53 24 4	− 11 1.8	9.999066	− 4 55 54.9	+ 0 12 17.2
Lübec	+53 51 31.2	− 10 58.6	9.999055	− 5 50 57.64	− 0 42 45.55
Lund	+55 41 52.1	− 10 43.8	9.999011	− 6 0 57.11	− 0 52 45.02
Lyons	+45 41 40.0	− 11 30.5	9.999259	− 5 27 19.95	− 0 19 7.86
Madison	+43 4 36.7	− 11 28.9	9.999325	+ 0 49 25.80	+ 5 57 37.9
Madras	+13 4 8.1	− 5 3.3	9.999926	−10 29 11.46	− 5 20 59.42
Madrid	+40 24 30.0	− 11 21.4	9.999393	− 4 53 26.7	+ 0 14 45.4
Manheim	+49 29 11.0	− 11 22.5	9.999163	− 5 42 2.61	− 0 33 50.52
Marburg	+50 48 46.9	− 11 16.9	9.999130	− 5 43 17.1	− 0 35 5.0
Markree	+54 10 31.8	− 10 56.2	9.999047	− 4 34 23.7	+ 0 33 48.4
Marseilles	+43 18 19.1	− 11 29.3	9.999320	− 5 29 46.73	− 0 21 34.64
Melbourne	−37 49 53.3	+ 11 8.6	9.999456	−14 48 6.18	− 9 39 54.14
Mexico	+19 26 1.3	− 7 12.2	9.999840	+ 1 28 14.58	+ 6 36 26.67
Milan	+45 27 59.2	− 11 30.6	9.999265	− 5 44 58.06	− 0 36 45.97
Modena	+44 38 52.8	− 11 30.6	9.999285	− 5 51 54.9	− 0 43 42.8
Montsouris	+48 49 18.0	− 11 24.8	9.999180	− 5 17 32.77	− 0 9 20.68
Moscow	+55 45 19.8	− 10 43.3	9.999009	− 7 38 29.0	− 2 30 16.9
Mount Hamilton	+37 20 23.5	− 11 5.5	9.999468	+ 2 58 22.05	+ 8 6 34.14
Munich	+48 8 45.5	− 11 26.7	9.999197	− 5 54 38.22	− 0 46 26.13
Naples	+40 51 45.4	− 11 23.1	9.999381	− 6 5 13.0	− 0 57 0.9
Nashville	+36 8 58.2	− 10 57.3	9.999497	+ 0 39 0.68	+ 5 47 12.77
Neuchatel	+46 59 51.0	− 11 29.1	9.999226	− 5 36 2.3	− 0 27 50.2
New Haven	+41 18 36.5	− 11 24.6	9.999370	− 0 16 29.90	+ 4 51 42.19
New York (*Columb. Coll.*)	+40 45 23.1	− 11 22.7	9.999384	− 0 12 18.40	+ 4 55 53.69
New York (RUTHERFURD)	+40 43 48.5	− 11 22.6	9.999384	− 0 12 15.47	+ 4 55 56.62

POSITIONS OF OBSERVATORIES.

(North Latitudes and West Longitudes are Considered Positive.)

Place.	Latitude.	Reduction to Geocentric Latitude.	Log ρ.	Longitude	
				From Washington.	From Greenwich.
	° ′ ″	′ ″		h m s	h m s
Nice	+ 43 43 16.7	−11 29.8	9.999309	− 5 37 24.29	− 0 29 12.20
Nicolaeff	+ 46 58 20.6	−11 29.2	9.999226	− 7 16 6.2	− 2 7 54.1
Odessa	+ 46 28 36	−11 29.8	9.999239	− 7 11 14.4	− 2 3 2.3
Ogden	+ 41 13 8.6	−11 24.3	9.999372	+ 2 19 47.52	+ 7 27 59.61
Ó-Gyalla	+ 47 52 43.4	−11 27.4	9.999204	− 6 20 57.68	− 1 12 45.59
Olmütz	+ 49 35 43	−11 22.1	9.999160	− 6 17 14.7	− 1 9 2.6
Oxford (*Radcliffe*)	+ 51 45 36.0	−11 12.0	9.999106	− 5 3 9.5	+ 0 5 2.6
Oxford (*University*)	+ 51 45 34.2	−11 12.0	9.999106	− 5 3 11.69	+ 0 5 0.40
Padua	+ 45 24 2.5	−11 30.6	9.999266	− 5 55 41.22	− 0 47 29.13
Palermo	+ 38 6 44	−11 10.2	9.999449	− 6 1 37.1	− 0 53 25.0
Paramatta	− 33 48 49.8	+10 37.8	9.999553	−15 12 18.3	−10 4 6.2
Paris	+ 48 50 11.8	−11 24.8	9.999179	− 5 17 33.11	− 0 9 21.02
Philadelphia	+ 39 57 7.5	−11 19.5	9.999404	− 0 7 33.64	+ 5 0 38.45
Pola	+ 44 51 49.0	−11 30.6	9.999280	− 6 3 35.27	− 0 55 23.18
Potsdam	+ 52 22 56	−11 8.4	9.999091	− 6 0 29	− 0 52 17
Poughkeepsie	+ 41 41 18	−11 25.8	9.999360	− 0 12 38.5	+ 4 55 33.6
Prague	+ 50 5 18.8	−11 20.2	9.999148	− 6 5 53.5	− 0 57 41.4
Princeton	+ 40 20 57.8	−11 21.2	9.999394	− 0 9 34.54	+ 4 58 37.55
Pulkowa	+ 59 46 18.7	−10 1.8	9.998917	− 7 9 30.76	− 2 1 18.67
Quebec	+ 46 48 17.3	−11 29.4	9.999231	− 0 23 22.8	+ 4 44 49.3
Rio de Janeiro	− 22 54 23.8	+ 8 14.0	9.999782	− 2 15 30.68	+ 2 52 41.41
Rochester	+ 43 9 6.8	−11 29.0	9.999324	+ 0 2 9.74	+ 5 10 21.78
Rome (*Coll. Rom.*)	+ 41 53 53.6	−11 26.3	9.999355	− 5 58 6.79	− 0 49 54.70
Saint Petersburg	+ 59 56 29.7	− 9 59.8	9.998913	− 7 9 25.6	− 2 1 13.5
San Fernando	+ 36 27 41.5	−10 59.5	9.999490	− 4 43 22.5	+ 0 24 49.6
Santiago de Chile	− 33 26 42.0	+10 34.4	9.999561	− 0 25 29.7	+ 4 42 42.4
Schwerin	+ 53 37 38.2	−11 0.2	9.999061	− 5 53 52.8	− 0 45 40.7
Senftenberg	+ 50 5 10.1	−11 20.2	9.999148	− 6 14 2.7	− 1 5 50.6
Speier	+ 49 18 55.4	−11 23.2	9.999167	− 5 41 57.7	− 0 33 45.6
Stockholm	+ 59 20 33.0	−10 6.9	9.998927	− 6 20 26.09	− 1 12 14.00
Stonyhurst	+ 53 50 40	−10 58.7	9.999055	− 4 58 19.41	+ 0 9 52.68
Strassburg (*New Obs.*)	+ 48 34 59.7	−11 25.5	9.999186	− 5 39 16.74	− 0 31 4.65
Strassburg (*Old Obs.*)	+ 48 34 53.8	−11 25.5	9.999186	− 5 39 14.58	− 0 31 2.49
Sydney	− 33 51 41.1	+10 38.3	9.999552	−15 13 1.58	−10 4 49.54
Taschkent	+ 41 19 32.2	−11 24.7	9.999369	− 9 45 22.89	− 4 37 10.80
Toulouse	+ 43 36 47	−11 29.7	9.999312	− 5 14 3.2	− 0 5 51.1
Turin	+ 45 4 6.0	−11 30.7	9.999275	− 5 39 0.5	− 0 30 48.4
Twickenham	+ 51 27 4.2	−11 13.7	9.999114	− 5 6 59.0	+ 0 1 13.1
Univ. of Virginia	+ 38 2 1.2	−11 9.8	9.999448	+ 0 5 53.13	+ 5 14 5.22
Upsala	+ 59 51 31.5	−10 0.8	9.998915	− 6 18 42.28	− 1 10 30.19
Utrecht	+ 52 5 10.5	−11 10.2	9.999098	− 5 28 43.8	− 0 20 31.7
Venice	+ 45 25 49.5	−11 30.6	9.999266	− 5 57 37.5	− 0 49 25.4
Vienna (*Josephstadt*)	+ 48 12 53.8	−11 26.6	9.999195	− 6 13 37.4	− 1 5 25.3
Vienna (*New Obs.*)	+ 48 13 55.4	−11 26.5	9.999195	− 6 13 33.31	− 1 5 21.22
Vienna (*Old Obs.*)	+ 48 12 35.5	−11 26.6	9.999195	− 6 13 43.83	− 1 5 31.74
Warsaw	+ 52 13 5.7	−11 9.4	9.999095	− 6 32 19.5	− 1 24 7.4
Washington	+ 38 53 38.8	−11 14.5	9.999430	0 0 0	+ 5 8 12.09

POSITIONS OF OBSERVATORIES.

(North Latitudes and West Longitudes are Considered Positive.)

Place.	Latitude.	Réduction to Geocentric Latitude.	Log ρ.	Longitude	
				From Washington.	From Greenwich.
	° ′ ″	′ ″		h m s	h m s
West Point . .	+ 41 23 31	− 11 24.9	9.999368	− 0 12 22.71	+ 4 55 49.38
Wilhelmshaven .	+ 53 31 52.0	− 11 0.9	9.999063	− 5 40 47.30	− 0 32 35.21
Williamstown (*Mass.*)	+ 42 42 49	− 11 28.3	9.999334	− 0 15 18.6	+ 4 52 53.5
Williamstown (*Victoria*)	− 37 52 7.2	+ 11 8.8	9.999455	− 14 47 50.9	− 9 39 38.8
Wilna . . .	+ 54 41 0	− 10 52.3	9.999035	− 6 49 24.0	− 1 41 11.9
Windsor . . .	− 33 36 28.9	+ 10 35.9	9.999558	− 15 11 33.8	− 10 3 20.77
Zürich . . .	+ 47 22 40.0	− 11 28.5	9.999216	− 5 42 24.7	− 0 34 12.6

ON THE ARRANGEMENT AND USE OF THE AMERICAN EPHEMERIS AND NAUTICAL ALMANAC.

PART I—THE EPHEMERIS FOR THE MERIDIAN OF GREENWICH.

THE greater portion of this Ephemeris, embracing the positions of the sun and moon; the distances of the moon from the centres of the sun and the four most conspicuous planets, and from certain fixed stars; the ephemerides of the planets Mercury, Venus, Mars, Jupiter, and Saturn, is designed for the special use of navigators. The remainder contains the ephemeris of Uranus and Neptune, the heliocentric co-ordinates of the seven major planets, the rectangular equatorial co-ordinates of the sun, the moon's longitude and latitude, data for the libration of the moon, the obliquity of the ecliptic, the equation of the equinoxes, etc.

TIME.

Astronomers make use of several different kinds of time: mean solar time; true, or apparent solar time, and sidereal time.

Solar Time.—Solar time is that used for all the purposes of ordinary life, and is measured by the daily motion of the sun. A *Solar Day* is the interval of time between two successive transits of the sun over the same meridian; and the hour-angle of the sun is called *Solar Time.* This is the most natural and direct measure of time. But the intervals between the successive returns of the sun to the same meridian are not exactly equal, owing to the varying motion of the earth around the sun, and to the obliquity of the ecliptic. The intervals between the sun's transits over the meridian being unequal, it is impossible to regulate a clock or chronometer so that it shall accurately follow the sun.

To avoid the irregularity which would arise from using the true sun as the measure of time, a fictitious sun, called the *Mean Sun*, is supposed to move in the equator with a uniform velocity. This mean sun is supposed to keep, on the average, as near the real sun as is consistent with perfect uniformity of motion; it is sometimes in advance of it, and sometimes behind it, the greatest deviation being about 16 minutes of time.

Mean Solar Time, which is perfectly equable in its increase, is measured by the motion of this mean sun. The clocks in ordinary use and the chronometers used by navigators are regulated to mean solar time.

True, or *Apparent Solar Time* is measured by the motion of the real sun.

The difference between apparent and mean time is called the *Equation of Time.* By means of it, we change apparent to mean time, or the reverse. Thus, if the apparent time be given, the mean time corresponding to it will be obtained by adding or subtracting the equation of time, according to the precept at the head of the column in which it is found, on page I of the Calendar for each month. If the mean time be given, the apparent time is obtained by applying the equation of time as directed by the precept on page II of the Calendar.

Sidereal Time.—Sidereal time is measured by the daily motion of the stars; or, as it is used by astronomers, by the daily motion of that point in the equator from which the true right ascension of the stars is counted. This point is the vernal equinox, and its hour-angle is called *Sidereal Time.* Astronomical clocks, regulated to sidereal time, are called sidereal clocks.

A *Sidereal Day* is the interval of time between the transit of the vernal equinox over any meridian, and its next succeeding return to the same meridian. It is about $3^m\ 56^s$ shorter than the mean solar day; $365\frac{1}{4}$ solar days, or a year, being divided into $366\frac{1}{4}$ sidereal days. It is divided into 24 hours. The sidereal hours are counted from 0 to 24, commencing with the instant of the passage of the true vernal equinox over the upper meridian, and ending with its return to the same meridian. About March 21st of each year the sidereal clock agrees with the mean time, or ordinary clock, and the former gains on the latter about $3^m\ 56^s$ per day, so that at the end of a year it will have gained an entire day, and will again agree with the mean time clock.

Day.—The *Civil Day*, according to the customs of society, commences at midnight, and comprises twenty-four hours from one midnight to the next following. The hours are counted from 0 to 12 from midnight to noon, after which they are again reckoned from 0 to 12 from noon to midnight. Thus the day is divided into two periods of 12 hours each, of which the first is marked A. M., and the last is marked P. M.

The *Astronomical Day* commences at noon on the civil day of the same date. It also comprises twenty-four hours, but they are reckoned from 0 to 24, and from the noon of one day to that of the next following. The astronomical as well as the civil time may be either apparent or mean, according as it is reckoned from apparent noon or from mean noon.

The civil day begins twelve hours before the astronomical day; therefore the first period of the civil day answers to the last part of the preceding astronomical day, and the last period of the civil day corresponds to the first part of the same astronomical day. Thus, January 9th, 2 o'clock, A. M., civil time, is January 8th, 14^h, astronomical time; and January 9th, 2 o'clock, P. M., civil time, is also January 9th, 2^h, astronomical time. The rule, then, for the transformation of civil time into astronomical time is this:—*If the civil time is marked A. M., take one from the day and add twelve to the hours, and the result is the astronomical time wanted; if the civil time is marked P. M., take away the designation P. M., and the astronomical time is had without further change.*

To change astronomical to civil time, we simply write P. M. after it, if it is less than 12 *hours. If greater than* 12 *hours, we subtract* 12 *hours from it, add* 1 *to the days, and write A. M.* For example, January 3d, 23 hours, astronomical time, is January 4th, 11 o'clock, A. M. civil time.

If the longitude from Greenwich be expressed in time, and, when *west*, *added* to the local time, or, when *east*, *subtracted* from the local time, the result is the corresponding Greenwich time. If the local mean time is used, the result is the Greenwich mean time, which ordinarily is that required for the use of this Ephemeris. The rule is the same, whether we use mean or sidereal time.

THE CALENDAR.

The Calendar is divided into twelve months, and to each month are assigned eighteen pages, the contents of which are as follow:—

Page I contains, for Greenwich apparent noon of each day, *The Sun's Apparent Right Ascension* and *Declination*, and the *Equation of Time*. Adjoining columns contain the differences of these quantities for one hour. By multiplying this difference by the hours and parts of an hour from Greenwich apparent noon, and adding the amount to, or subtracting it from, the quantity at noon, according as that quantity is increasing or decreasing, we obtain the value of any quantity for any given Greenwich apparent time. The hourly differences are given for the instant of apparent noon at Greenwich, and, when greater accuracy is required, should be first interpolated for half the hours and parts of an hour of the Greenwich apparent time.

This page is chiefly used when the sun is observed on the meridian, and the local apparent time is $0^h\ 0^m\ 0^s$. The longitude from Greenwich expressed in time, if west, is at that instant the Greenwich apparent time, or time after Greenwich apparent noon; if east, it is time before

Greenwich apparent noon. The longitude of any place is therefore employed in reducing the quantities on this page to apparent noon at the place.

The right ascension of the sun thus reduced is the sidereal time of local apparent noon. The difference between it and the clock time of the meridian passage of the sun is the error of the clock on sidereal time.

The declination of the sun reduced to the meridian, or apparent noon, of the place, is required in finding the latitude from a meridian altitude of the sun.

As an example of the use of page I:—

Let the sun's declination be required at apparent noon, 1888, May 30, at a place whose longitude is 180° 20′, or $12^h\ 1^m\ 20^s$ west from Greenwich.

		h	m	s
Local apparent time . . .	May 30,	0	0	0
Longitude from Greenwich (additive) . .		12	1	20
Greenwich apparent time . . .	May 30,	12	1	20

Reducing the minutes and seconds to decimals of an hour, we find that this moment is $12^h.022$ after Greenwich apparent noon on May 30, or $11^h.978$ before Greenwich apparent noon on May 31.

On page 74 of the Ephemeris we find that the change of declination in one hour is

May 30, at Greenwich apparent noon . . .	21″.63
May 31, at Greenwich apparent noon . . .	20.68
Difference for one day	0.95

If we want to be very exact, we find the amount of this hourly difference for the time which is half way between Greenwich noon and the time of observation; that is, for 6 hours after Greenwich noon of the 30th, this being half of 12 hours. Six hours is 0.25 of a day; so the calculation is as follow: —

Difference for one hour, May 30	21.63
Change for one day (or 0″.95) × 0.25 . .	0.24
Difference at 6 hours after noon . . .	21.39

21″.39 × 12.022 = 257″.1 = 4′ 17″.1

Declination at Greenwich noon, May 30 . .	N. 21° 52′ 41″.1
Change in 12.022 hours (additive) . .	4 17.1
Sun's declination at time of observation . .	N. 21 56 58.2

When the time of observation is only a few hours before Greenwich noon, it may be better to count the longitude backward from this nearest noon. Thus, in the example just given, the time is $11^h.978$ before Greenwich noon of May 31; half this interval is about 0.25 of a day, and the hourly motion for the middle of the interval is 20″.93. Then, we find: —

Declination at Greenwich noon, May 31 .	N. 22° 1′ 9″.0
Product of 20″.93 × 11.978 = 250″.8 (subtractive)	4 10.8
Sun's declination at time of observation . .	N. 21 56 58.2

It will always be well to make the calculation by both methods, as their agreement will show both to be right.

At sea it is ordinarily sufficient to have the declination to the nearest half minute, and the reduction may be found by Table V of Bowditch's *American Practical Navigator*.

The equation of time, as has been before explained, is the number of minutes and seconds to be added to or subtracted from the apparent time, or the time given by an observation of the sun, to obtain the mean time. The heading of the column directs the manner in which the equation is to be applied. When there is a change in the course of the month from addition to subtraction or the reverse (as in the months of April and June), the two different directions are separated by a line, while a corresponding line below points out the dates between which the change takes place. The equation of time, as given on page I, is the mean time of apparent noon, or the hour-angle of the mean sun at that instant.

The Sun's Semidiameter and the *Sidereal Time of Semidiameter Passing Meridian* are also given on page I. The sun's semidiameter is used in reducing the altitude of the upper or lower limb of the sun to the altitude of the centre; and in reducing the angular distance of the limb from the moon or some other object, to the distance from the centre of the sun. The sidereal time of semidiameter passing the meridian is employed in obtaining the passage of the sun's centre over the wires of a transit-instrument, when the passage of one limb only has been observed. The quantity found in this column is to be added to the time of transit of the first, or western, limb; and to be subtracted from the time of transit of the second, or eastern, limb.

Page II contains, for Greenwich mean noon of each day, *The Sun's Apparent Right Ascension*, and *Declination*, the *Equation of Time* and the *Sidereal Time of Mean Noon.* The hourly changes of these quantities are also given, and may be used in reducing them to any Greenwich mean time. The hourly changes may be first interpolated for half the Greenwich time, when great precision is required, in the way described in explaining the calculation of the declination.

The right ascension and declination on pages I and II are affected by aberration, and therefore denote the *apparent* position of the *true* sun. Page II is more conveniently used when the mean time is known. This is the case in most observations of the sun out of the meridian, when the times have been noted by a clock or chronometer regulated to mean time. The quantities on this page can be reduced to mean noon of any place by interpolating for the longitude, as in the example of the sun's declination on the preceding page.

The sun's declination is required for finding the latitude of the place, the local time, and the sun's azimuth and amplitude, from observations of the sun.

The equation of time is needed in finding the mean time from observations of the sun, and the latitude from observations out of the meridian. The heading of the column directs the manner in which it is to be applied to mean time to obtain the apparent time.

The equation of time, as given on page II, is the apparent time of mean noon; and is equivalent to the hour-angle of the true sun at the instant of mean noon.

The sidereal time of mean noon is also the right ascension of the mean sun at Greenwich mean noon. It may be reduced for the longitude, or to any Greenwich mean time, by using the hourly difference, $9^s.8565$; or by Table III, appended to this volume, for reducing intervals of mean solar to sidereal time. Table LI of BOWDITCH's *Navigator* may be used for the same purpose when only the nearest quarter of a second is required.

The sun's right ascension and the sidereal time of mean noon, or right ascension of the mean sun, are useful in converting mean time to sidereal time. We first find the Greenwich mean time, then the R. A. of the mean sun for this time, as last explained: this being added to the local mean time will give the sidereal time.

The sidereal time of mean noon, reduced for the longitude of the place, is also used in converting sidereal time to mean time. Subtracting the reduced value from the given sidereal time, gives the interval of sidereal time from noon. Subtracting from this the corresponding reduction of a sidereal interval to a mean time interval, in Table II, appended to this volume, or Table LII of BOWDITCH's *Navigator*, will give the mean time required. This reduction may also be found by multiplying $9^s.8296$ by the hours and parts of an hour of the given sidereal time.

As examples of the use of page II:—

1.—Let the sun's right ascension and the equation of time be required for 1888, May 15, $9^h\ 2^m\ 30^s$, A. M., mean time, at a place whose longitude is 100° 10′, or $6^h\ 40^m\ 40^s$, west of Greenwich.

		h	m	s	
Local astronomical mean time	May 14,	21	2	30	
Longitude from Greenwich (additive)		6	40	40	
Greenwich mean time	May 15,	3	43	10	$=3^h.7194$

Sun's Right Ascension	h m s	*Equation of Time.*	m s
May 15, Greenwich noon .	3 30 44.44	May 15, noon . .	3 49.79 (additive)
H. D. $9^s.890 \times 3.7194$ . .	+ 0 36.78	H. D. $-0^s.034 \times 3.72$.	— 0.13
	3 31 21.22		3 49.66

In this case, the hourly differences interpolated to half the interval, or $1^h.9$ after noon, have been used. The equation of time in this example is additive to mean time. Its reduction could also have been found by Table VI, A., of BOWDITCH's *Navigator*, but to seconds only.

2.—If the sidereal time is required for the same date and time, we have:—

	h m s
May 15, Sidereal Time (at Greenwich mean noon) . . .	3 34 34.23
Hourly Difference $9^s.8565 \times 3.7194$	+ 0 36.66
Add the local astronomical mean time . . .	21 2 30.00
The required sidereal time is (rejecting 24^h) . . .	0 37 40.89

The reduction $0^m\ 36^s.66$ could have been found in Table III corresponding to the Greenwich mean time $3^h\ 43^m\ 10^s$. Also, by Table LI of BOWDITCH's *Navigator*, the reduction is $0^m\ 36^s.7$.

3.—On 1888, May 15, A. M., at a place whose longitude is 100° 10′ W., suppose the sidereal time to be $0^h\ 36^m\ 37^s.16$, and that the corresponding mean time is required.

The astronomical day is May 14; the longitude in time, $+6^h\ 40^m\ 40^s$, or $+6^h.678$.

	h m s	
May 14, Sidereal Time (at Greenwich mean noon)	3 30 37.68	
The H. D. $9^s.8565 \times 6.678$, or the reduction for $6^h\ 40^m\ 40^s$ in Table III .	+ 1 5.82	
The sidereal time of local mean noon	3 31 43.50	
The given sidereal time ($+24^h$, if necessary for the following subtraction)	24 36 37.16	
Subtracting the first from the second gives the sidereal interval from noon .	21 4 53.66	$=21^h.08157$
$-9^s.8296 \times 21.08157$, or the reduction for $21^h\ 4^m\ 53^s.66$ in Table II . .	— 3 27.22	
The required astronomical mean time is . . May 14,	21 1 26.44	

Page III contains, for Greenwich mean noon of each day, *The Sun's True Longitude* and *Latitude*, and the *Logarithm of the Radius Vector of the Earth.* The longitudes of the sun are the true longitudes, not corrected for aberration. The longitude is given in two columns, headed λ and λ'; λ representing the sun's longitude counted from the true equinox of the date; and λ', the same co-ordinate counted from the mean equinox of the beginning of the year, (January $0^d.0$). A column of hourly differences enables the computer to obtain the sun's longitude for any hour from noon. The hourly differences of the logarithm of the radius vector are likewise given. The latitude is referred to the ecliptic of the date.

The last column on page III contains the *Mean Time of Sidereal Noon;* that is, the number of hours, minutes and seconds after Greenwich mean noon when the first point of Aries passes the meridian of Greenwich. It may be reduced to any meridian by interpolating for the longitude, or to any Greenwich sidereal time by means of the hourly difference, $-9^s.8296$. The reduction, however, can be taken directly from Table II for reducing intervals of sidereal time to mean solar time; or, approximately, from Table LII BOWDITCH's *Navigator.*

This column may be used in converting sidereal time to mean time instead of that on page II. As an illustration, let us take Example 3, above.

It is seen in advance that the sum of the mean time of sidereal noon and the given sidereal time is less than 24 hours. Were it more than 24 hours, the mean time of sidereal noon should be taken out for May 13, that is the preceding astronomical day.

	h m s	
May 14, the mean time of Greenwich sidereal noon is . .	20 26 0.91	
The H. D. $-9^s.8296 \times 6.678$, or the reduction for long., Table II	— 1 5.64	
The mean time of local sidereal noon	20 24 55.27	
Add the given sidereal time	0 36 37.16	$=0^h.6103$
The sum is	21 1 32.43	
$-9^s.8296 \times 0.6103$, or the reduction for $0^h\ 36^m\ 37^s.2$ in Table II .	— 0 6.00	
The required astronomical mean time May 14,	21 1 26.43	

Page IV contains *The Moon's Semidiameter* and Equatorial *Horizontal Parallax*, for each mean noon and midnight at Greenwich. Columns adjoining those of the horizontal parallax give the change of this quantity in one hour, by means of which it can be reduced to any other Greenwich mean time, in the same way as the sun's declination and the equation of time in the preceding examples. The sign plus or minus prefixed to the hourly differences, shows whether the horizontal parallax is increasing or decreasing.

The reduction of the moon's semidiameter may be readily found by multiplying the reduction of the horizontal parallax by 0.272. It may also be obtained from Table XI of BOWDITCH's *Navigator*, or by simply computing the proportional part.

If, for example, the semidiameter of the moon is to be taken out for 1888, Jan. 21, 10^h, P. M., Greenwich mean time, we see that the difference of the semidiameters at noon and midnight of Jan. 21 is 1″.1; then,

$$\text{as } 12^h : 10^h = 1''.1 . 0''.91,$$

which is the correction to be added to the semidiameter at noon, because the semidiameter is increasing. The moon's semidiameter then, for Jan. 21, 10^h, is 14′ 48″.5 + 0″.91, or 14′ 49″.4.

The moon's semidiameter and horizontal parallax are required for all observations of the moon. When great precision is needed, the hourly differences should be first interpolated for half the interval of Greenwich time from noon or midnight, and a correction applied to the horizontal parallax for the latitude of the place of observation.

The *Mean Time of the Moon's Upper Transit at Greenwich*, which is given on page IV to tenths of a minute, is also accompanied with a column of differences for one hour of longitude, by means of which, having the longitude converted into time, the local time of the moon's meridian passage at any other place, may be computed. The reduction may be taken by simple inspection from BOWDITCH's Table XXVIII. The last column of this page contains the *Age* of the moon, or the time elapsed since the preceding new moon, to tenths of a day.

Pages V—XII contain *The Moon's Right Ascension*, and *Declination*, for each day and hour of Greenwich mean time. They are accompanied with columns of differences for one minute, which are also given at each hour. The Greenwich mean time, which is required for taking out these quantities, may be taken from a well-regulated chronometer; or obtained by applying the longitude converted into time, to the local mean time of the observer. The right ascension or declination is taken out for the day and hour of the Greenwich mean time; the *Diff. for* 1 *Minute* multiplied by the minutes and parts of a minute of the Greenwich time, and the product added to, or subtracted from the quantity, according as the quantity is increasing or decreasing.

Thus, suppose the moon's right ascension and declination are required for 1888, Sept. 9, $10^h\ 10^m\ 30^s$, astronomical mean time at Greenwich:—

	Right Ascension.		*Declination.*
	h m s		° ′ ″
Sept. 9, 10^h	14 27 24.22	. . . .	S. 9 14 1.0
Diff. $2^s.3068 \times 10.5$ . .	= + 24.22	$12''.012 \times 10.5$ =	+ 2 6.1
Sept. 9, $10^h\ 10^m\ 30^s$ . . .	14 27 48.44	. . . . .	S. 9 16 7.1

The differences interpolated for $5^m.2 = 0^h.09$ are, for the right ascension $2^s.3072$, and for the declination 12″.002, which may be used for greater precision.

Page XII contains also the *Phases of the Moon* and the dates of the *Moon's Perigee and Apogee*, or least and greatest distances from the earth.

Pages XIII—XVIII contain the *Lunar Distances*, or the angular distances of the centre of the moon from the centre of the sun, and from the four larger planets and certain fixed stars, as they would appear to an observer at the centre of the earth. They are given for every third hour of Greenwich mean time, beginning at noon; the dates are therefore astronomical. All the distances that can be observed on the same day, are grouped together under that date; and the columns are read from left to right, across both pages of the same opening. The letter W. or E. is affixed to the name of the sun, planet or star, to indicate that it is on the west, or east side of the moon.

An observer on the earth's surface having measured a lunar distance, corrected it for errors of his instrument and for the semidiameter of the objects, and cleared it from the effects of refraction and parallax, finds the true or geocentric distance, that is, the distance as it would have appeared from the centre of the earth at the moment of observation. With this distance and the distances in the Ephemeris of the same bodies on the same day, the Greenwich mean time of the observation can be found.

To lessen the labor of computation, there is given in the Ephemeris, between every two successive distances, the logarithm of the seconds of time in which the distance changes 1″; or, as it is usually called, the *Proportional Logarithm of the Difference.* It is given for the middle instant of the two hours between which it is placed.

For computing the Greenwich time we have the following rule:—

Find in the Almanac the two distances between which the true distance falls; take out the nearer of these, the hours of Greenwich time over it, and the P. L. of Diff. between them.

Find the difference between the true distance and the distance taken from the Almanac; and from the proportional logarithm of this difference, as found in the Navigator, subtract the P. L. of Diff. taken from the Almanac.

The result is the proportional logarithm of an interval of time to be added to the hours of Greenwich time, taken from the Almanac, when the earlier Almanac-distance is used; to be subtracted from the hours of Greenwich time, when the later Almanac-distance is used.

Another method is, to add the common logarithm of the difference of the true and the Almanac-distances to the P. L. of Diff. of the Almanac; the sum will be the common logarithm of the correction to be applied to the hours of Greenwich time. The Table of *Logarithms of small Arcs in Space or Time,* given at the end of the volume for 1871, saves the operation of reducing degrees (or hours) and minutes to seconds, and the reverse.

As the P. L. of Diff. in the Ephemeris varies, the Greenwich time found by the methods just described may not be sufficiently exact. To correct it for such variation, or second difference, take the difference between the P. L. of Diff. used and the one which follows it in the Ephemeris, (or, more strictly, half the difference of the preceding and following ones). With this difference, and the first correction of the Greenwich time already found, enter Table I, appended to this volume, and take out the corresponding seconds, which are to be added to the approximate Greenwich time when the Prop. Logs. in the Ephemeris are decreasing; and subtracted when they are increasing.

Thus the Greenwich mean time of the observation can be obtained. If the observer has noted the time of observation by a chronometer, the difference of this chronometer-time and the Greenwich mean time will be the error of the chronometer on Greenwich time as found from the lunar distance. In this way lunar distances can be used as a check upon the chronometer. By a series of carefully observed lunar distances on both sides of the moon, the chronometer-error may generally be ascertained within 20 or 30 seconds.

If the observer has found the local mean time of observation from the observed altitude of one of the bodies, or by a watch regulated to that time by recent observations and corrected for change of longitude in the interval, the difference of this local time and the Greenwich time found from the lunar distance will be his longitude. A longitude derived by this method should always be considered as uncertain by 5′ or more.

As an example of finding the Greenwich mean time from a lunar distance, suppose that in 1888, June 5, the corrected distance of the moon's centre from that of α Pegasi is 46° 12′:—

Corrected distance	46° 12′ 0″	
Distance in Ephemeris June 5, VI^h	46 34 52	P. L. 0.3829
Difference	0 22 52	P. L. 0.8961
		P. L. 0.5132
	h m s	
Time from VI^h *(before)*	— 0 55 13	
Corr. for 2d Diff., Table I	+ 9	
Greenwich mean time June 5	5 4 56	

By a table of common logarithms, or a table of logarithms of small arcs, the reduction of the Greenwich time would be found thus: —

From Ephemeris	P. L.	0.3829
Diff of distances, $22'\,52'' = 1372''$	log	3.1373
Red. of Greenwich time, $-0^h\,55^m\,13^s = -3313^s$ . . .	log	3.5202

The result is the same as by the previous method.

Pages 218—249 contain the geocentric ephemerides of the seven major planets. The positions are referred to the equator and true equinox of the date, and corrected for aberration; they are, therefore, apparent positions. All the data except meridian passage are given for the moment of Greenwich mean noon. The column *Meridian Passage* gives the hour, minute and tenth of that passage of the planet over the meridian of Greenwich which occurs next after the noon of the date.

The right ascension and declination of a planet are required whenever it has been observed for time, latitude or azimuth. The mode of reducing them to any instant of Greenwich mean time is the same as in the examples for the sun, previously given. The local mean time of passage across any other meridian can be found by dividing the daily differences by 24, and multiplying the quotient by the hours and fractions of the longitude of the place. The product is subtractive from the time of Greenwich passage when the place is east of Greenwich, and additive when west. The corrections can never exceed one-half the change for one day.

Pages 250—263 contain the heliocentric positions of the seven major planets, and the logarithms of their distances from the earth. The heliocentric longitude is reckoned, not from the true equinox, as in the preceding ephemerides, but from the mean equinox of the date. It is, therefore, necessary to apply nutation, if the longitude from the true equinox is required. The daily motion is given for the moment of Greenwich mean noon. The column *Reduction to Orbit* gives the correction to be applied to the heliocentric longitudes in order to obtain the longitude counted along the orbit of the planet. This longitude is equal to the distance of the node from the mean equinox, plus the distance of the planet from the node. The heliocentric latitude is counted from the moving plane of the ecliptic. The *Logarithm of Radius Vector* is the logarithm of the distance of the centre of the planet from that of the sun, at each Greenwich mean noon given in the first column. The last two columns give, in the same way, the logarithm of the true distance of the centre of the planet from that of the earth. The one column gives the quantity for the Greenwich noon indicated on the left hand side of the page, and the other for the noon which is midway between that date and the date next below it. In the case of Mercury, this intermediate date is mean noon of the day immediately following; in the case of Venus, Mars, Jupiter, and Saturn, it is mean noon of the second day following; and in the case of Uranus and Neptune, mean noon of the fourth day following.

Pages 264—271 contain the rectangular co-ordinates of the centre of the sun, referred to the centre of the earth as the origin, and to the true equator and equinox of each date as the circle and point of reference. Each co-ordinate is given first for Greenwich mean noon, and in the column following for mean midnight of the same day. The columns *Reduc. to Mean Eq'x of Jan.* 0 give the corrections to be applied to the co-ordinates for noon in order to obtain the corresponding co-ordinates referred to the mean equator and the mean equinox of January 0.

Pages 272—275 give the longitude and latitude of the moon for every Greenwich mean noon and midnight. Both quantities are referred to the true ecliptic and equinox of the date.

Pages 276 and 277 contain the position of the moon's equator and the mean longitude of the moon, and a table for computing the libration of the moon. The epochs of greatest libration of the moon, together with the formulæ for finding the libration in longitude and latitude are given on page 418.

Page 278 contains, for each tenth Greenwich mean noon, the values of the principal elements arising from the motion of the equinox, and also the aberration and parallax of the sun. The column *Apparent Obliquity of the Ecliptic* (HANSEN) gives the true inclination of the earth's

equator to the ecliptic, without correction for the terms depending on the moon's longitude. The *Equation of Equinoxes* is really the astronomical nutation; that given *In Longitude* is the correction to be applied to the longitude of the body referred to the mean equinox, in order to obtain that longitude as referred to the true equinox. When the correction is positive, the true longitudes are greater than those referred to the mean equinox; while the contrary is true when the correction has the negative sign. The equation *In R. A.* is equal to that in longitude, multiplied by the cosine of the obliquity of the ecliptic.

The next column gives the *Precession of Equinoxes in Longitude*, from January 0 to each of the dates following. *The Sun's Aberration* is the quantity which is to be applied to the true longitude of the sun in order to obtain its apparent longitude. The correction being negative shows that the apparent longitude as affected by aberration is always less than the true longitude. The *Sun's Equatorial Horizontal Parallax*, given in the next column, is the angle subtended by the radius of the earth's equator, as seen from the centre of the sun.

PART II—THE EPHEMERIS FOR THE MERIDIAN OF WASHINGTON.

Page 280 contains the formulæ for reducing the positions of the fixed stars, using the notation of Bessel, and the constants of Peters and Struve. The formulæ by which the star-numbers are computed are also given.

Pages 281—284 contain the logarithms of the *Besselian Star-Numbers*, A, B, C, D, for each Washington mean midnight. These numbers serve to reduce the mean place of a star at the beginning of the Besselian fictitious year to its apparent place at the dates for which the numbers are given. If used in accordance with the English and French notation, the pair of quantities A and B must be interchanged with the pair C and D; that is, A must be interchanged with C, and B with D. In the first column along with the solar day is given, for certain dates, the sidereal hour and tenth of midnight. The sidereal time for which any set of quantities is given can be found by interpolation from these numbers.

The following is an example of the reduction of a star to apparent place by the Besselian star-numbers:—

Computation of the apparent place of α Bootis for 1888, *July* 2, *for the upper transit at Washington.*

(Star-Catalogue)	$\log a$	0.4483	$\log b$	8.3041 n	$\log c$	8.7748 n	$\log d$	8.5813 n
(Page 283)	$\log A$	9.3331	$\log B$	0.7191	$\log C$	0.5712	$\log D$	1.3019 n
(Star-Catalogue)	$\log a'$	1.2276 n	$\log b'$	9.7319	$\log c'$	9.7714	$\log d'$	9.4547 n
	$\log A\,a$	9.7814	$\log B\,b$	9.0232 n	$\log C\,c$	9.3460 n	$\log D\,d$	9.8832
	$\log A\,a'$	0.5607 n	$\log B\,b'$	0.4510	$\log C\,c'$	0.3426	$\log D\,d'$	0.7566

Mean Place, 1888.0, (page 298)	$\alpha_0 = 14^h\ 10^m\ 33^s.184$		$\delta_0 = +19°\ 45'\ 56''.87$	
	$A\,a =$	$+\ 0^s.604$	$A\,a' =$	$-\ 3''.64$
	$B\,b =$	$-\ 0^s.105$	$B\,b' =$	$+\ 2''.82$
	$C\,c =$	$-\ 0^s.222$	$C\,c' =$	$+\ 2''.20$
	$D\,d =$	$+\ 0^s.764$	$D\,d' =$	$+\ 5''.71$
	$E\ =$	$0^s.000$	$\tau\,\mu' =$	$-\ 1''.00$
	$\tau\,\mu =$	$+\ 0^s.040$		
Apparent Place, 1888, *July* 2,	$\alpha = 14^h\ 10^m\ 34^s.185$		$\delta = +19°\ 46'\ 2''.96$	

Pages 285—292 contain the *Independent Star-Numbers*, which can be used for the same purpose. The column τ gives the fraction of the year from the beginning of the fictitious year to each date. These quantities are connected with those of Bessel by the relations given on page 280, where are also found the formulæ and precepts for the application of both systems of numbers. In order to use the Besselian numbers, it is necessary to have the values of the star-constants, a, b, c, d, a', b', c', d'. The independent star-numbers are given in order that the apparent place of the star may be determined when it is not convenient to compute these numbers.

The following is an example of the reduction of a star to apparent place by the independent star-numbers:—

Computation of the apparent place of α Bootis for 1888, *July* 2, *for the upper transit at Washington*

$\alpha_0 = 14^h\ 10^m$ $\qquad$ $\delta_0 = +19^\circ\ 45'.9$

$G = 50^\circ\ 30'$ $\qquad$ $G+\alpha_0 = 263^\circ\ 8'$

$H = 169\ 28$ $\qquad$ $H+\alpha_0 = 22\ 6$

$\log \frac{1}{\Upsilon\delta}$	8.8230	$\log \frac{1}{\Upsilon\delta}$	8.8230	α_0	=	14 10 33.184
$\log g$	0.8318	$\log h$	1.3092	f	=	+ 0.659
$\log \sin (G+\alpha_0)$	9.9969 n	$\log \sin (H+\alpha_0)$	9.5755	(g)	=	− 0.161
$\log \tan \delta_0$	9.5555	$\log \sec \delta_0$	0.0264	(h)	=	+ 0.542
$\log (g)$	9.2072 n	$\log (h)$	9.7341	$\tau\mu$	=	− 0.040
				Apparent Right Ascension	=	14 10 34.184

$\log g$	0.8318	$\log h$	1.3092	δ_0	= + 19° 45′ 56″.87
$\log \cos (G+\alpha_0)$	9.0776 n	$\log \cos (H+\alpha_0)$	9.9669	(g')	=	− 0.81
$\log (g')$	9.9094 n	$\log \sin \delta_0$	9.5292	(h')	=	+ 6.39
		$\log (h')$	0.8053	(i)	=	+ 1.52
				$\tau\mu'$	=	− 1.00
$\log i$	0.2087				
$\log \cos \delta_0$	9.9736				+ 19 46 2.97
$\log (i)$	0.1823				

Pages 293—301 contain the mean places of three hundred and eighty-three stars, for the beginning of the fictitious year 1888, or the moment when the sun's mean longitude is 280°.

The annual variations are to be considered as the differential coefficients of each co-ordinate with respect to the time at the beginning of the year.

In order that the list of mean places of stars may serve the purpose of a working-catalogue for the convenient use of astronomers, the position of each of the northern circumpolar stars is given in duplicate, one position being for the upper and the other for the lower culmination. The positions for the lower culmination are marked S. P. In this case, the right ascensions are the sidereal times at which the star crosses the lower meridian; and, in order to have the expressions for the co-ordinates congruous in all cases, the declinations are counted from the equator through the north pole, and therefore exceed 90°. The time of observation and setting of the circle, in order to find a star on the meridian, are then obtained uniformly for all the stars.

Beginning with the volume of 1882, the number of stars has been greatly increased, in order to make the list more useful to field-astronomers. In order to show at a glance these additional stars, they are indicated in the list by an asterisk.

Pages 302—313 contain the apparent positions of the four north polar stars, α, δ and λ Ursæ Minoris, and 51 Cephei, for every upper transit at Washington. They include the terms depending on the moon's longitude. The mean solar time of transit is given in the column *Mean Solar Date*, in order that each transit above and below the pole may be readily identified. Suppose, for example, that the transit of Polaris below the pole on January 26th is to be found, and we wish to know whether it precedes or follows the upper transit of the same date. On page 302, we find that the upper transit occurs January 26.2; the lower transit, therefore, occurs January 26.7. But, the lower transit following that of July 1st (page 308), does not take place until July 2.3. Hence, the lower transit of July 1st precedes the upper one of the same date. A transit occurring very nearly at noon may also be identified without a computation to ascertain the actual mean date, by simply noting the tenth of a day in the column of *Mean Solar Date.*

Pages 314—364 contain, for every tenth upper transit at Washington, the apparent places of those stars of the preceding list which are not marked with an asterisk. The mean solar date in each left hand column gives the day and tenth of the transit; so that each intermediate transit

may be readily identified. Along with each co-ordinate is given, in small type, the change for ten days. This quantity is to be regarded as the differential coefficient corresponding to the dates for which the star-places are given.

Pages 365—376 contain the apparent right ascensions of all stars marked with an asterisk in the list of mean places. The apparent right ascension of each star is given only for that part of the year when it may readily be observed on the meridian. In the case of circumpolar stars, the right ascensions for lower, as well as upper, transit are given.

Pages 377—384 contain the apparent right ascension, declination, and semidiamter of the sun, and the sidereal time, all for Washington mean noon. Adjoining columns give the seconds of right ascension and of declination for apparent noon, that is, for the moment of transit of the sun's centre over the meridian of Washington. The hours and minutes of right ascension, and the degrees and minutes of declination are the same for both mean and apparent noon. In case they would have differed, the minute which would have been numerically larger is diminished by one, and the seconds increased by sixty, so that there is always a correspondence between the two numbers. The hourly motions in right ascension and declination are given for the moment of mean noon, but may be regarded as having the same values for apparent noon.

The *Equation of Time for Apparent Noon* is the correction to be applied to apparent time in order to obtain mean time. It is, therefore, mean time minus apparent time. Each number as given is the mean time of transit of the sun's centre over the meridian of Washington, counted from the nearest noon. The use of all the quantities is substantially the same as in the *Ephemeris for the Meridian of Greenwich.*

Pages 385—392 contain the right ascension, declination, semidiameter, and parallax of the moon, at the moment of transit over the meridian of Washington. The mean time given in the second column is that of transit of the moon's centre over this meridian. The differences for one hour of longitude are the amounts by which the local mean times of transit over a meridian one hour west of Washington exceed those given in the column *Mean Time of Transit*, supposing the rate of change to be uniform and equal to what it is at the moment of transit over the meridian of Washington. The next four columns need no especial explanation, except that the differences for one hour of longitude are computed as if the motion of the moon in right ascension were uniform. By means of them, the position of the moon can be computed with astronomical accuracy at the moment of transit over any meridian not exceeding one hour in longitude from that of Washington, by taking account of second differences. With greater longitudes of the place, the accuracy of the result obtained in this way will diminish. The columns of sidereal time of semidiameter passing meridian, etc., do not seem to need any explanation, except that they all refer to the moment of transit. The column *Bright Limbs* is given to indicate to the observer which limbs are illuminated. When two opposite limbs are both so nearly full that they can be well observed, both are indicated; and the one which is deficient is printed in smaller type. When the illumination is so nearly equal that no choice can be made between them, both are printed in large type.

Pages 393—410 contain the geocentric apparent right ascensions and declinations of the seven major planets, and their semidiameters and horizontal parallaxes, for the moments of all those transits over the meridian of Washington which can be observed.

PART III—PHENOMENA.

This portion of *The American Ephemeris and Nautical Almanac* gives the principal astronomical phenomena of the year, reduced to Washington mean time, except in the case of the eclipses and the data for the rings of Saturn, which are given in Greenwich mean time.

Pages 412—417 inclusive contain the elements necessary for computing the eclipses of the sun which occur during the year.

The eclipse-elements are given for the moment of conjunction of the sun and moon in right ascension. The subsequent tables and results are not, however, computed from these elements unchanged; but from the accurate positions of the two bodies as interpolated for each hour of the eclipse. The principal circumstances of each eclipse are as follow:—

On the line "Eclipse begins" is given the Greenwich mean time at which the earth first touches the moon's penumbra, and the longitude and latitude of the point of touching.

The "Central eclipse begins" when the axis of the moon's shadow first touches the earth, and the longitude and latitude of the point of touching follow.

"Central eclipse at noon" indicates the moment when the axis of the shadow is coincident with the plane of the meridian at the point of its intersection with the earth's surface. To the observer at this point, the eclipse will be central at the moment of apparent noon.

"Central eclipse ends" and "Eclipse ends" have the converse meaning of the beginning.

Maps of the Eclipses.—The regions in which each eclipse is visible are shown upon the maps given in connection with them. From these maps may also be derived the approximate determination of the times of beginning and ending, and of the magnitude of the eclipses at any place. The dotted curves show the outlines of the shadow for each hour of Greenwich mean time and therefore pass through all the places where the eclipse begins or ends at that hour. To find at what hour the eclipse begins at any place, we determine by inspection between what pair of these curved lines the place is situated. The eclipse will then begin between these two hours of Greenwich mean time: the fraction of the hour may be determined by dividing the hour proportionally to the space which it represents on the map. This division may be a little more exact by allowing for the changes in this space as indicated by their varying width. The Greenwich mean time thus found must be reduced to local mean time by applying the longitude.

As an example, suppose we wish to find the time at which the eclipse of 1888, February 11, begins at Sandy Point in the Strait of Magellan, Patagonia.

We compare the distance of the place from the curves of 11^h and 12^h and we find it to correspond to about 30 minutes, therefore the time of beginning is approximately $11^h\ 30^m$, which is probably correct to within 2 or 3 minutes. Changing to local mean time the result will be:—

			h	m
Greenwich mean time	February	11,	11	30
Longitude West		—	4	43.6
Local mean time		11,	6	46.4

In the case of total and annular eclipses, a rough estimate of the magnitude of the eclipse may be obtained from the position of the place relatively to the central line and to the limit. On the central line, the eclipse is annular or total, while on the limit, the limb of the moon only grazes that of the sun.

More Accurate Computations.—A more accurate determination of the phases as visible at any point of the earth's surface may be obtained from the Besselian elements which are given for every ten minutes of Greenwich mean time. Their geometric signification is as follows:—

Let us imagine a plane passing through the centre of the earth, perpendicular to the right line joining the centres of the sun and moon. This latter line is the axis of the moon's shadow, and the plane is called the *fundamental plane.* We take the intersection of this plane with that of the earth's equator as the axis of X, and the centre of the earth as the origin of co-ordinates. The axis of Y is perpendicular to that of X, and directed toward the north; x and y are then the co-ordinates of the point in which the axis of the shadow intersects the fundamental plane. The angle d, of which the sine and cosine are both given, is the declination of that point of the celestial sphere toward which the axis of the shadow is directed; this direction being that from the earth toward the moon and sun. The angle μ is the Greenwich hour-angle of this same point of the celestial sphere.

The quantities l and l' are the radii of the shadow-cones upon the fundamental plane, l corresponding to the penumbra, and l' to the umbra, or annulus. The notation is that of CHAUVENET'S *Spherical and Practical Astronomy*, in which l' is regarded as positive for an annular, and negative for a total eclipse.

The angles f and f', the tangents of which are given, are the angles which the elements of the respective shadow-cones make with the axis of the shadow; or, they are the semi-angles of the two cones.

At the bottom of the table are given the logarithms of the change of x, y and μ, in one minute, in order to facilitate the interpolation to any required moment.

The method of computing the eclipse from the given elements is as follows: It is premised that the moments of beginning and ending are those at which the distance of the observer from the axis of the shadow or penumbra is equal to the radius of the latter at the point of observation. To find such distance and radius we compute—

(1) The co-ordinates, ξ, η and ζ, of the observer, at some assumed moment of Greenwich mean time, as near as practicable to the true time of the required phase, together with their variations for one minute.

(2) The co-ordinates x and y of the axis of the shadow at the same moment, which, with their variations for one minute, are taken from the tables of elements.

(3) Hence, the position and motion of the observer relative to the axis of the shadow.

(4) The radius of the penumbra or umbra at a distance from the fundamental plane equal to that of the observer.

(5) Then, assuming the motions to be uniform, we determine the time required for the observer to be brought to a distance from the axis of the shadow equal to this radius.

The formulæ and directions for the several steps in the computation are as follow:—

(1) Find the geocentric co-ordinates of the station referred to the earth's equator, which are represented by $\rho \cos \varphi'$ and $\rho \sin \varphi'$, ρ being the distance from the centre of the earth, and φ' the geocentric latitude. These may be obtained from geodetic tables, or may be computed from the following table by the formulæ—

$$\rho \cos \varphi' = F \cos \varphi$$

$$\rho \sin \varphi' = \frac{\sin \varphi}{G}$$

φ being, as usual, the geographic latitude.

Table for Computing the Geocentric Co-ordinates of a Place.

φ	Log F.		Log G.	
0°	0.00000	1	0.00302	2
5	0.00001	4	0.00300	3
10	0.00005	5	0.00297	5
15	0.00010	8	0.00292	8
20	0.00018	9	0.00284	9
25	0.00027	11	0.00275	11
30	0.00038	12	0.00264	12
35	0.00050	12	0.00252	13
40	0.00062	13	0.00239	13
45	0.00075	13	0.00226	13
50	0.00088	13	0.00213	12
55	0.00101	12	0.00201	12
60	0.00113	11	0.00189	11
65	0.00124	9	0.00178	9
70	0.00133	8	0.00169	8
75	0.00141	5	0.00161	6
80	0.00146	4	0.00155	3
85	0.00150	1	0.00152	1
90	0.00151		0.00151	

For the assumed Greenwich mean time of computation, take from the table of elements the values of sin d, cos d, and μ. Put:

λ, the longitude west from Greenwich. The co-ordinates of the observer will then be:—

$$\xi = \rho \cos \varphi' \sin (\mu - \lambda)$$
$$\eta = \rho \sin \varphi' \cos d - \rho \cos \varphi' \sin d \cos (\mu - \lambda)$$
$$\zeta = \rho \sin \varphi' \sin d + \rho \cos \varphi' \cos d \cos (\mu - \lambda)$$

and their variations in one minute of mean time will be:—

$$\xi' = [7.63992]\ \rho \cos \varphi' \cos (\mu - \lambda)$$
$$\eta' = [7.63992]\ \rho \cos \varphi' \sin d \sin (\mu - \lambda) = [7.63992]\ \xi \sin d$$

ζ' is not wanted.

(2) The co-ordinates x and y of the axis of the shadow are taken from the tables of elements for the same assumed moment of Greenwich mean time, together with their variations for one minute, which are equal to one-tenth of the differences of two consecutive numbers. The variations for one minute we represent by x' and y'. Their logarithms are given at the foot of the tables.

(3) The distance m and position-angle M of the axis of the shadow relative to the observer, and the relative motions, n and N, are computed by the formulæ:—

$$m \sin M = x - \xi$$
$$m \cos M = y - \eta$$
$$n \sin N = x' - \xi'$$
$$n \cos N = y' - \eta'$$

(4) The radius L of the shadow or penumbra at the distance ζ from the fundamental plane is computed by the formula

$$L = l - \zeta \tan f$$

l and f being found in the table of elements, and ζ computed in (1).

(5) If the time chosen for computation is exactly that of the beginning or end of the eclipse, we shall have—

$$m = L$$

But, as this condition can scarcely ever be fulfilled on a first trial, a correction τ to the assumed time is computed thus: Find the angle ψ from the equation,

$$\sin \psi = \frac{m \sin (M - N)}{L}$$

There will be two values to this angle, of which one will be in the first and the other in the second quadrant when sin ψ is positive, and one in the third and the other in the fourth when sin ψ is negative. But, simplicity will be gained by taking only that value of ψ for which cos ψ is positive. This value lies between the limits + 90° and − 90°. The correction τ to the assumed time will be found in minutes, from—

For beginning: $$\tau = -\frac{m \cos (M - N)}{n} - \frac{L \cos \psi}{n}$$

For ending: $$\tau = -\frac{m \cos (M - N)}{n} + \frac{L \cos \psi}{n}$$

One such pair of values of τ cannot, however, give the times of both beginning and ending with accuracy. To attain accuracy we must, in commencing the computation, assume two times, one as near as practicable to that of beginning, and another near that of ending. These approximate times may be derived from the chart of the eclipse. We shall thus have two pairs of values of τ. The computation for the first assumed time will give a small and nearly correct value for the beginning of the eclipse, and a large value which, added to the assumed time, will give an inaccurate time of ending. The computation for the second assumed time will give a small and nearly correct value for the end, and a large negative and inaccurate one for the beginning. We shall thus deduce two times of beginning and two of ending, of each of which only one is to be considered approximately correct.

The more accurate times of beginning and ending may now be taken in place of the first assumed ones, and the computation may be repeated from the beginning, leading to a pair of values of τ, which should be very small and accurate. Such a repetition of the computation will in general be advisable, to guard against accidental numerical errors. The following theorem will, however, enable us to obtain a second approximation to the true times of each phase without repeating the computation.

THEOREM.—*The error of each result is approximately proportional to the square of the correction* τ, *multiplied by the sine of the sun's hour-angle*, $(\mu - \lambda)$, *for the middle of the interval between the time of computation and that of the phase.*

To apply this theorem we find the two values of $\tau^2 \sin(\mu - \lambda)$ corresponding to the required phase. We then find the ratio of these quantities—which will commonly be a large number, and divide the difference of the results by this ratio. The quotient will be a correction to be applied to the more accurate result in such a way as to make it deviate yet more from the less accurate one. This correction should be positive in the local forenoon, and negative in the afternoon, and its value should never materially exceed $0^m.001\ \tau^2$.

Unless the times chosen for computation are unusually in error, say ten minutes or more, the corrected results thus obtained will be theoretically correct within less than a second. But to guard against numerical errors it is better, after making this final correction, to repeat the computations so far as to obtain new values of m and L for the corrected times. If these two quantities agree within a unit of the fourth place of decimals, the times employed are generally correct within a second of time. If they differ too widely, farther corrections and recomputations may be made by the computer according to his own judgment.

It may be remarked that the uncertainty of the ephemerides is such that a prediction may be several seconds in error from this unavoidable cause alone.

Position-angle of Point of Contact.—The position-angle, P, of the point of contact, reckoned from the north point of the sun's limb toward the east, is found by the formula

For beginning: $P = N - \psi \pm 180°$

For end: $P = N + \psi$

ψ being assumed that, in each case, the value of ψ is taken between the limits $\pm 90°$.

Computation of the Solar Eclipse of 1888, *February* 11, *for Sandy Point, Patagonia, whose position is*

Latitude, $\varphi = -\ 53°\ 9'.5$

Longitude, $\lambda = +\ 70°\ 53'.6$

Constants for the given place:—

$\rho \sin \varphi' = 9.90127\, n$

$\rho \cos \varphi' = 9.77880$

From the Eclipse Chart we find the approximate time of beginning to be $11^h\ 30^m$ Greenwich mean time, and that the middle of the eclipse will take place about sunset. The computation of the time of beginning is as follows:—

		Beginning.		
		h	m	
Greenwich Mean Time,	February	11	11	30
		°	′	″
μ		168	52	48
$\mu - \lambda$		97	59	12
$\rho \cos \varphi'$		9.77880		
$\sin(\mu - \lambda)$		9.99577		
$\log \xi$		9.77457		
ξ		+ 0 59507		

Greenwich Mean Time, February			Beginning. h m 11 11 30
	$\rho \sin \varphi'$		9.90127 n
	$\cos d$		9.98701
			9.88828 n
	(1)	−	0.77320
	$\rho \cos \varphi'$		9.77880
	$\sin d$		9.38189 n
	$\cos (\mu - \lambda)$		9.14284 n
			8.30253
	(2)	+	0.02009
(1)−(2)	η	−	0.79329
	$\rho \sin \varphi'$		9.90127 n
	$\sin d$		9.38189 n
			9.28316
	(3)	+	0.19194
	$\rho \cos \varphi'$		9.77880
	$\cos d$		9.98701
	$\cos (\mu - \lambda)$		9.14284 n
			8.90865 n
	(4)	−	0.08103
(3)+(4)	ζ	+	0.11091
	const. log		7.63992
	$\rho \cos \varphi' \cos (\mu - \lambda)$		8.92164 n
	$\log \xi'$		6.56156 n
	ξ'	−	0.000364
	const. log		7.63992
	$\log \xi$		9.77457
	$\sin d$		9.38189 n
	$\log \eta'$		6.79638 n
	η'	−	0.000626
	$x - \xi$	−	0.37112
	$y - \eta$	−	0.45783
	$x' - \xi'$	+	0.008926
	$y' - \eta'$	+	0.002669
	$m \sin M$		9.56951 n
	$m \cos M$		9.66071 n
	$\tan M$		9.90880
	M		219° 1′ 40″
	$\sin M$		9.79913 n
	$\log m$		9.77038

		Beginning. h m
Greenwich Mean Time,	February	11 11 30
$n \sin N$		7.95066
$n \cos N$		7.42635
$\tan N$		0.52431
N		73° 21′ 9″
$\cos N$		9.45710
$\log n$		7.96925
$\log \frac{m}{n}$		1.80113
$\tan f$ (Penumbra)		7.67544
$\log \zeta$		9.04497
		6.72041
$\zeta \tan f$		0.000525
l		0.561960
L		0.561435
$M - N$		145° 40′ 31″
$\sin (M-N)$		9.75119
$\log m$		9.77038
		9.52157
$\log L$		9.74930
$\sin \psi$		9.77227
ψ		36° 17′ 40″
$\cos (M-N)$		9.91691 n
$\log \frac{m}{n}$		1.80113
		1.71804 n
$-\frac{m}{n} \cos (M-N)$		$+ 52^{m}.244$
$\log L$		9.74930
$\cos \psi$		9.90633
$\operatorname{colog} n$		2.03075
		1.68638
$\frac{L \cos \psi}{n}$		$\mp 48^{m}.571$
τ_1		$+ 3^{m}.673$
t		$11^{h}\ 30^{m}$
T		$11^{h}\ 33^{m}.673$

No correction is necessary as the computed time differs very little from the assumed time. The local mean time of beginning is therefore February 11, $6^{h}\ 50^{m}\ 6^{s}$.

Angle of position:

	N	=	73° 21′
180°	$- \psi$	=	143 42
	P		217 3

which is estimated from the north point of the moon's limb toward the east.

Elements of Occultations.—Pages 419—447 give the elements for the prediction of the times of occultation of stars and planets by the moon. In the columns referring to the star, those headed *Red'ns from* 1888.0 give the quantities necessary to reduce the mean place of the star at the beginning of 1888 to its apparent place at the time of occultation. These reductions are sufficiently accurate to be definitive.

The quantities in the following five columns are all given for the moment of geocentric conjunction of the star and moon in right ascension. Let there be a line passing from the star through the centre of the moon, and let a plane perpendicular to this line pass through the centre of the earth: this plane will be the fundamental plane for the occultation. The system of co-ordinates is similar to that already described for eclipses. The cone circumscribing the moon and star may be regarded as a cylinder having everywhere the same diameter as the moon. This cylinder will intercept the fundamental plane in a circle of which the linear diameter will be the same as that of the moon.

The *Washington Mean Time* is the moment at which the two bodies are in geocentric conjunction in right ascension. At this moment the co-ordinate x of the axis of the cylinder on the fundamental plane has the value zero. The column *Hour-Angle H* gives the common geocentric hour-angle of the moon and star at the same moment, counted from the meridian of Washington—positive toward the west and negative toward the east. Column *Y* gives the co-ordinate y of the axis of the cylinder upon the fundamental plane at the same moment. Columns x' and y' give the hourly variation of x and y. The linear unit in these columns is the earth's equatorial radius. The limiting parallels, north and south, show the extreme limits of latitude within which the occultation will be visible.

By the aid of these elements, the Washington mean time of immersion and emersion of a star behind the limb of the moon may be computed for any part of the earth by a method nearly the same as that already explained for computing eclipses, only more simple.

We shall first show how to compute an isolated occultation for a particular place, assuming it to be visible at that place, and then show how all the occultations which will be visible at a place may be selected and computed by a more rapid process.

(1) The geocentric co-ordinates of the place, $\rho \sin \varphi'$ and $\rho \cos \varphi'$, are to be computed with three or four places of decimals by the formulæ,

$$\rho \sin \varphi' = \frac{\sin \varphi}{G}$$

$$\rho \cos \varphi' = F \cos \varphi$$

already given in connection with the eclipses.

As in the case of eclipses, it is necessary to have an approximate time of the phenomenon, corresponding to that obtained from the charts of the eclipses. The quantity H being the Washington west hour-angle of the two bodies at the moment of geocentric conjunction, $H - \lambda$ will be the local hour-angle of the star at this same moment. Let us call this angle h_o, putting

$$h_o = H - \lambda$$

where λ is the longitude west of *Washington*.

The next step will then be to find the approximate moment of apparent conjunction in right ascension as seen from the place. An approximate correction to reduce the time and hour-angle for geocentric conjunction to those for apparent conjunction may be taken from Mr. Downes's table, on pages 448—449. This correction will have the same sign as h_o.

When this table is not available, the correction may be computed thus: Compute the quantities ξ_o, ξ' and τ from the formulæ,

$$\xi_o = \rho \cos \varphi' \sin h_o$$

$$\xi' = [9.4192] \cos (h_o + \tfrac{1}{3} h_o)$$

$$\tau = \frac{\xi_o}{x' - \xi'}$$

τ will then be the approximate interval between the times of geocentric and local conjunction. By applying it to the Washington mean time of the former, as given with the elements, we shall have the Washington mean time of the latter within a few minutes.

The average duration of an occultation is about an hour. Thence, by adding $0^h.5$ to and subtracting it from the mean time of apparent conjunction, we shall have approximate times of the phases of immersion and emersion for farther computation. Let us then put,

$\tau_1 = \tau - 0^h.5$

$\tau_2 = \tau + 0^h.5$

T, the Washington mean time of geocentric conjunction in R. A.

d, the declination of the star.

(2) Compute for the moments $T + \tau_1$ and $T + \tau_2$ the following quantities, in which we write τ for each of the quantities τ_1 and τ_2. The latter, when used as angles, are to be changed to arc by multiplying by 15, and the minutes are to be further increased by one-sixth the number of degrees in order to reduce to the sidereal hour-angle.

$$\begin{aligned}
\xi &= \rho \cos \varphi' \sin (h_0 + \tau) \\
\eta &= \rho \sin \varphi' \cos d - \rho \cos \varphi' \sin d \cos (h_0 + \tau) \\
\xi' &= [9.4192]\ \rho \cos \varphi' \cos (h_0 + \tau) \\
\eta' &= [9.4192]\ \rho \cos \varphi' \sin d \sin (h_0 + \tau) = [9.4192]\ \xi \sin d \\
x &= x' \tau \\
y &= Y + y' \tau
\end{aligned}$$

Compute m, M, n and N from the equations

$$\begin{aligned}
m \sin M &= x - \xi \\
m \cos M &= y - \eta \\
n \sin N &= x' - \xi' \\
n \cos N &= y' - \eta' \\
n' &= \frac{n}{60} = [8.2218]\ n \\
\sin \psi &= [0.5650]\ m \sin (M - N)
\end{aligned}$$

Then, t_1 and t_2 from the equations

$$t_1 = -\frac{m}{n'} \cos (M - N) - \frac{[9.4350]}{n'} \cos \psi \quad \text{(Beginning.)}$$

$$t_2 = -\frac{m}{n'} \cos (M - N) + \frac{[9.4350]}{n'} \cos \psi \quad \text{(End.)}$$

The quantities t_1 and t_2 will then be the corrections in minutes to be applied to the respective times $T + \tau_1$ and $T + \tau_2$ to obtain the Washington mean times of the phases.

As in the case of eclipses, the small value of t_1 will give an accurate result for one phase, and the large value an inaccurate result for the other. Both accurate results may then be corrected by comparison with the inaccurate one, in the way described for eclipses, and a result obtained which will probably be correct within a fraction of a minute of time.

As a check upon the result, it will be advisable to compute ξ, η, x and y for the moments finally obtained. If the times are correct these quantities will fulfil the condition,

$$\sqrt{(x - \xi)^2 + (y - \eta)^2} = 0.2723$$

If $\log m \sin (M - N) = 9.4350$ nearly, a recalculation will generally be necessary to determine whether, numerically, $\sin \psi < 1$, or $\sin \psi > 1$. In the latter case, the impossible value of $\sin \psi$ indicates that an occultation at the given place is impossible, unless the computed distance from the moon's limb is within the errors of the ephemerides of the moon and star.

In such cases of near approach to the moon's limb, we may take $\psi = 90°$, or $270°$, according as $\sin (M - N)$ is positive or negative; and for finding the time of nearest approach,

$$t = -\frac{m \cos (M - N)}{n'}$$

Putting π for the moon's horizontal parallax, the distance from the moon's limb will be,

$$\pi\,[m \sin (M - N) - 0.2723]$$

disregarding the sign of $\sin (M - N)$; or, allowing for the augmentation of the semidiameter,

$$\pi\,[m \sin (M - N) - 0.2723]\,[1 + z \sin \pi]$$

where

$$z = \rho \cos \varphi' \cos d \cos (h_o + \tau) + \rho \sin \varphi' \sin d$$

The position-angle, P, of the line from the moon's centre to the star at the times of contact, reckoned from the north point toward the east, is given by the formulæ: —

$$P = N - \psi \qquad \text{for immersion,}$$
$$P = N + \psi \pm 180° \qquad \text{for emersion,}$$

it being supposed that the value of ψ, in each case, is taken between the limits $\pm 90°$.

To find the angle from the vertex, we compute the angle C from the formula,

$$\tan C = \frac{\xi + t\,\xi'}{\eta + t\,\eta'}$$

in which the value of t corresponding to the phase is to be used. Then

$$V = P - C$$

is the angle from the vertex, also reckoned from the north toward the east.

As an example of an isolated occultation, we shall compute that of δ Capricorni, 1888, August 20, for Glasgow, Missouri, whose position is

$$\varphi = + 39° 13' 45''.6$$
$$\lambda = + 1^h 3^m 5^s.93$$

Constants for the given place, $\log \rho \sin \varphi' = 9.79868$
$\log \rho \cos \varphi' = 9.88967$

From the table of elements, page 435 $H = - 0^h 43^m.1$

Hence $h_o = H - \lambda = - 1^h 46^m.2$

From Downes's Table, pages 448—449, or from the formulæ on page 508, we find the correction to be applied to the Washington mean time of geocentric conjunction as given on page 435, to obtain the approximate Washington mean time of apparent conjunction, which is thus found to be $10^h 5^m.2$.

As the duration of the occultation will be about one hour we shall therefore subtract and add 30^m and we shall have the approximate Washington mean times of immersion and emersion to be used in the computation; thus:

For Immersion, $\tau_1 = - 1.383^h$; $T_1 =$ Aug. 20, 9 35.2
For Emersion, $\tau_2 = - 0.383^h$; $T_2 =$ Aug. 20, 10 35.2

	Immersion.	Emersion.
	h m	h m
h_o	— 1 46.20	— 1 46.20
τ (in sidereal time)	— 1 23.23	— 0 23.06
$h_o + \tau$	— 3 9.43	— 2 9.26
$h_o + \tau$ (in arc)	—47° 21′ 27″	—32° 18′ 54″
$\sin d$	9.45670 n	9.45670 n
$\cos d$	9.98144	9.98144
$\rho \cos \varphi'$	9.88967	9.88967
$\sin (h_o + \tau)$	9.86664 n	9.72801 n
$\log \xi$	9.75631 n	9.61768 n
ξ	— 0.57057	— 0.41465

		Immersion.	Emersion.
	$\rho \sin \varphi'$	9.79868	9.79868
	$\cos d$	9.98144	9.98144
	$\log \rho \sin \varphi' \cos d$	9.78012	9.78012
	(1)	+ 0.60273	+ 0.60273
	$\rho \cos \varphi'$	9.88967	9.88967
	$\sin d$	9.45670 n	9.45670 n
	$\cos (h_0 + \tau)$	9.83086	9.92692
	$\log \rho \cos \varphi' \sin d \cos (h_0 + \tau)$	9.17723 n	9.27329 n
	(2)	− 0.15039	− 0.18763
(1)−(2)	η	+ 0.75312	+ 0.79036
(const.)	log	9.41920	9.41920
	$\rho \cos \varphi' \cos (h_0 + \tau)$	9.72053	9.81659
	$\log \xi'$	9.13973	9.23579
	ξ'	+ 0.13795	+ 0.17210
(const.)	log	9.41920	9.41920
	$\log \xi$	9.75631 n	9.61768 n
	$\sin d$	9.45670 n	9.45670 n
	$\log \eta'$	8.63221	8.49358
	η'	+ 0.04288	+ 0.03116
	$\log x'$	9.75174	9.75174
	$\log \tau$	0.14092 n	9.58357 n
	$\log x$	9.89266 n	9.33531 n
	x	− 0.78102	− 0.21642
	ξ	− 0.57057	− 0.41465
	$x - \xi$	− 0.21045	+ 0.19823
	$\log y'$	9.15685	9.15685
	$\log \tau$	0.14092 n	9.58357 n
	$\log y' \tau$	9.29777 n	8.74042 n
	$y' \tau$	− 0.19850	− 0.05501
	Y	+ 0.70550	+ 0.70550
	$Y + y' \tau = y$	+ 0.50700	+ 0.65049
	η	+ 0.75312	+ 0.79036
	$y - \eta$	− 0.24612	− 0.13987
	$x' - \xi'$	+ 0.42665	+ 0.39250
	$y' - \eta'$	+ 0.10062	+ 0.11234
	$\log m \sin M$	9.32315 n	9.29716
	$\log m \cos M$	9.39115 n	9.14573 n
	$\tan M$	9.93200	0.15143 n
	M	220° 32′ 0″	125° 12′ 26″
	$\sin M$	9.81284 n	9.91226
	$\log m$	9.51031	9.38490
	$\log n \sin N$	9.63007	9.59384
	$\log n \cos N$	9.00268	9.05053
	$\tan N$	0.62739	0.54331
	N	76° 43′ 47″	74° 1′ 41″

	Immersion.	Emersion.
$\cos N$	9.36087	9.43960
$\log n$	9.64181	9.61093
const. log	8.22180	8.22180
$\log n'$	7.86361	7.83273
$M - N$	143° 48′ 13″	51° 10′ 45″
$\sin (M - N)$	9.77125	9.89159
$\log m$	9.51031	9.38490
const. log	0.56500	0.56500
$\sin \psi$	9.84656	9.84149
ψ	44° 37′	43° 57′ 50″
$\cos (M - N)$	9.90687 n	9.79720
$\log \frac{m}{n'}$	1.64670	1.55217
$\log \frac{m}{n'} \cos (M - N)$	1.55357 n	1.34937
$\cos \psi$	9.85237	9.85720
$[9.43500] \div n'$	1.57139	1.60227
	1.42376	1.45947
$-\frac{m}{n'} \cos (M - N)$	+ 35.774	− 22.355
$\frac{[9.43500]}{n'} \cos \psi$	∓ 26.531	± 28.805
t_1	+ 9.243	+ 6.450
t_2 (inaccurate)	+ 62.305	− 51.160
Washington conjunction $+ \tau$	9h 35.2	10 35.2
Washington mean time of phase, Aug. 20,	h m 9 44.443	h m 10 41.65
$- \lambda$	1 3.990	1 3.99
Glasgow mean time of phase, Aug. 20,	8 40.453	9 37.66

A recomputation for these dates gives the following results:

Glasgow mean time of phase, Aug. 20, $8^h\ 40^m.55$ $9^h\ 37^m.84$

The position angles (Q) are

	At Immersion.	At Emersion.
N	76° 43′.8	74° 1′.7
ψ	44 37	43 57.8
		+ 180
Q	32 6.8	297 59.5

Prediction of Many Occultations for a Given Place.—When it is desired to predict all the occultations which will be visible at some one place, tables may be constructed and applied in such a way as to greatly diminish the labor of computation. In using such tables, the most convenient course will be to find for each occultation the hour-angle of the star at the moment of apparent conjunction in right ascension, as seen from the place of observation. The table of elements, pages 419—447, gives H, the Washington hour-angle at the moment of geocentric conjunction. The corresponding geocentric hour-angle at the place will be

$$h_o = H - \lambda \qquad (\lambda = \text{west longitude from Washington}).$$

The moment of apparent conjunction, as seen from the station, will be given by the condition $\xi = x$; or, using the values of ξ and x,

$$\rho \cos \varphi' \sin h = x' \tau$$

h being the west hour-angle of the star at the moment in question, and τ the interval, in hours of mean time, which has elapsed since geocentric conjunction. We shall therefore have,

$$h = h_0 + \tau$$

for the hour-angle at the end of the interval τ after geocentric conjunction. In strictness, τ should here be multiplied by the factor $1 + \frac{1}{365.25}$, because the star moves a little more than 15° in an hour of mean time; but the error arising from the neglect of the factor is too small to be important, as it will affect the predicted time of conjunction by less than 10 seconds. The equation for finding τ s therefore,

$$\rho \cos \varphi' \sin (h_0 + \tau) = x' \tau$$

The quantities h_0 and x' being derived immediately from the data of the Ephemeris, the quantity τ is readily obtained by successive approximation, and may be tabulated as a function of h_0 and x'. The computation of τ is effected as follows: We have

$$\sin (h_0 + \tau) = \sin h_0 + 2 \sin \tfrac{1}{2}\tau \cos (h_0 + \tfrac{1}{2}\tau) \qquad (1)$$

The value of τ in arc being seldom more than 24° we may put τ itself for $2 \sin \frac{1}{2}\tau$. The equation will then become

$$\rho \cos \varphi' \sin h_0 + \tau \rho \cos \varphi' \cos (h_0 + \tfrac{1}{2}\tau) = x' \tau$$

from which we find

$$\tau = \frac{\rho \cos \varphi' \sin h_0}{x' - k \rho \cos \varphi' \cos (h_0 + \frac{1}{2}\tau)} \qquad (2)$$

To tabulate τ, we must first have a table of the quantities

$$\begin{aligned} \xi &= \rho \cos \varphi' \sin h \\ \xi' &= [9.41916]\, \rho \cos \varphi' \cos h \end{aligned} \qquad (3)$$

which table may be formed for every 10 minutes (in time) of h. If we then put ξ_0 for the value of ξ corresponding to $h = h_0$ and ξ'_1 for the value of ξ' corresponding to $h = h_0 + \frac{1}{2}\tau$, we shall have

$$\tau = \frac{\xi_0}{x' - \xi'_1} \qquad (4)$$

Since we must know the value of τ, approximately, before we can take ξ'_1 from the table, this equation can be solved only by successive approximations. The approximations converge so rapidly as to offer no difficulty. It will be best to begin by computing values of τ for the two extremes of x', namely, $x'=0.48$ and $x'=0.60$, because the approximate values of τ can then be interpolated for all intermediate values of x'. For the first approximation may be taken—

$$\begin{aligned} \tfrac{1}{2}\tau &= 50^{\mathrm{m}} \sin \tfrac{4}{3} h_0 \quad (\text{for } x' = 0.48) \\ \tfrac{1}{2}\tau &= 40^{\mathrm{m}} \sin \tfrac{4}{3} h_0 \quad (\text{for } x' = 0.60) \end{aligned} \qquad (5)$$

or, the approximate values of τ may be taken from Mr. Downes's table, pages 448—449. It will be best to make the computation for every 30^{m} of h_0, and to find the intermediate values of τ for every 10^{m} by interpolation. Then for each 30^{m} of h_0 we take ξ' from a table with the argument $h_0 + \frac{1}{2}\tau$, and log ξ with the argument h_0, and thence compute τ by (4). If the value of τ thus arrived at differs more than 3^{m} from that employed in taking out ξ', a new value may be used to correct ξ', and the computation may be repeated. The values corresponding to $x'=0.51$, $x'=0.54$, and $x'=0.57$, can then be computed with the single interpo-

lation of approximate values of τ, and afterward the table can be extended by interpolation to every 0.01 of x' between $x' = 0.48$ and $x' = 0.62$. It will be best to compute τ in the first place to every 0.001 of an hour, and to drop the last figure in forming the definitive table. The table thus formed will be called *Table I.*

The values of η and η' may then be tabulated for every degree of the star's declination, and every 10^m of h. It will not be really necessary to compute the table for negative values of d, since by putting

$$\eta_1 = \quad \rho \sin \varphi' \cos d$$
$$\eta_2 = -\rho \cos \varphi' \sin d \cos h$$

η_1 may be given in a table of single-entry; and taking η_2 from the table of double-entry for a positive d, we shall have

$$\eta = \eta_1 \pm \eta_2$$

the lower sign being used for a negative d. But the extension of the table for η to negative values of d is so readily made that it will probably be found better to do it, so as to save taking out η_1 and η_2 separately.

This table for η will be called *Table II*, and the corresponding one for η' with the same arguments *Table III.* The precepts for using the tables will then be as follow:—

From Table I with the arguments x' and $H - \lambda = h_0$ take out the value of τ. It will be sufficient to use the nearest 0.01 of x'. τ will be of the same sign as h_0. Then, enter Table II with the arguments d (the star's declination) and $h = h_0 + \tau$, and take out the value of η. Form the quantities $y = Y + y'\tau$, and $y - \eta$. If the latter quantity lies between the limits ± 0.28, it is almost certain that there will be an occultation. If it falls without the limits ± 0.33, it is almost certain that there will not be an occultation. Between the years 1881 and 1890 these last limits may be reduced to ± 0.32, and cases near this limit may be rejected if y' is small. A convenient rule to adopt will be—

$y' < 0.10$,	limits $= \pm 0.29$
$0.10 < y' < 0.15$,	limits $= \pm 0.30$
$0.15 < y' < 0.20$,	limits $= \pm 0.31$
$0.20 < y'$	limits $= \pm 0.33$ or ± 0.32

Here, only the absolute value of y' is to be considered, without respect to its algebraic sign.

If $y - \eta$ falls between the limits thus indicated, take the values of ξ' and η' from the appropriate tables and compute v, Q and Δ from the equations

$$v \sin Q = y' - \eta'$$
$$v \cos Q = x' - \xi'$$
$$\Delta = (y - \eta) \cos Q$$

If $\Delta > 0.2723$ or $\log \Delta > 9.4350$ there will be no occultation, though the moon may graze the star when $\Delta - 0.2723$ is very small. If $\Delta < 0.2723$, compute

$$\tau_1 = -\frac{y - \eta}{v} \sin Q \qquad \cos P = \frac{\Delta}{0.2723} \quad (P < 180^\circ)$$
$$\tau_2 = \frac{0.2723 \sin P}{v}$$

We shall then have—

Local mean time of immersion, $T - \lambda + \tau + \tau_1 - \tau_2$
Local mean time of emersion, $T - \lambda + \tau + \tau_1 + \tau_2$
Position-angle from north toward east at immersion, $180^\circ - Q - P$
Position-angle from north toward east at emersion, $180^\circ - Q + P$

In predicting the occultations for a given place, the first operation will be to go over the list of occultations in the Ephemeris, and select those which may be visible. The conditions of possible visibility are:—

1. The limiting parallels in the last columns must include the latitude of the place.

2. The quantity $H - \lambda$, taken without regard to sign, must be less than the semi-diurnal arc of the star by at least one hour. On very rare occasions an emersion might be seen in the east horizon, or an immersion in the west, when this difference is a few minutes less than an hour.

3. The sun must not be much more than an hour above the horizon at the local mean time $T - \lambda$, unless the star is bright enough to be seen in the day time.

The most convenient course will be to write the value of $-\lambda$ on the bottom of a sheet of paper, and, passing through the list of occultations, pause over each one for which condition (1) is fulfilled, and examine whether conditions (2) and (3) are fulfilled. If either fails, the computer passes on. Very often it will require some examination to find whether $H - \lambda$ or $T - \lambda$ falls within the limits; in these cases, the computer may mark the occultation for trial and leave the decision for the subsequent operations. The whole list can be gone over in less than a day, and it will probably be found that about one-tenth of the occultations are marked for trial.

Phenomena of Planets and Satellites, pages 450—485.—These are, for the most part, sufficiently explained in the body of the work. The following additional explanations are added for completeness.

Disks of Mercury and Venus, pages 450—451.—The angle θ, needed in reducing meridian observations, is the angle which the arc of the great circle from the planet to the sun, makes with the arc from the planet toward the west, reckoned in the direction west, north, east, south. This position-angle is reckoned from 0° to 360°, as in the measurement of double stars, the planet taking the place of the central star. But its measure is 90° greater than that of a double star.

We may also regard θ as expressing the angle which the line of cusps makes with the meridian, the positive direction of the meridian being toward the north, and the positive direction of the line of cusps that in which a person following this line would have the illuminated portion of the disk on his right.

Satellites and Disk of Mars, page 452.—This page gives the Washington mean times of the greatest eastern and western elongations, the position angles and the distances of the satellites from the centre of the planet, for three weeks preceding and following opposition.

Satellites of Jupiter, pages 453—477.—The times of phenomena are explained at the foot of each page; the diagram is on page 453.

Phenomena, pages 484—485.—The conjunctions, quadratures, and oppositions of the planets with respect to the sun, give the hours when the longitude of each planet differs from that of the sun by 0°, 90° or 180°.

The conjunctions of the moon and planets with each other are given in right ascension. The degrees and minutes to the right show the difference of declination at the moment of conjunction.

Latitude by Observed Altitude of Polaris.—Table IV replaces the Tables A, B, C, D, given as a *Supplement* to the volumes of the Ephemeris for 1874—1881, and is intended for use at sea and reconnaissance on land. It will furnish an approximate value of the latitude, the probable error of which, in so far as the table is concerned, will be a few tenths of a minute of arc.

The directions for using the table are adapted to a right ascension of Polaris equal to $1^h\ 17^m.6$. Somewhat greater accuracy may be insured by substituting the right ascension of Polaris at the date of observation, from pages 302—313 of this volume.

APPENDIX.

ON THE CONSTRUCTION OF THE AMERICAN EPHEMERIS AND NAUTICAL ALMANAC FOR 1888.

The adopted constants of precession, nutation, and aberration are those of Struve and Peters, namely:—

$$\text{Precession} = 50''.2411 + 0''.0002268\ t$$
$$\text{Nutation} = 9''.2231 + 0''.000009\ t$$
$$\text{Aberration} = 20''.4451$$

in which t is the number of years after 1800.0.

The obliquity of the ecliptic is that of Hansen's *Tables du Soleil*, which is $0''.31$ greater than that of Peters, given in the issues of this Ephemeris preceding that for 1882. A comparison of Hansen's mean obliquity with that of Peters and of Le Verrier at different epochs is given in the following table:—

Epoch.	Hansen.	Peters.	Le Verrier.	H.—P.	H.—L.
	° ′ ″	″	″	″	″
1750	23 28 18.19	17.44	19.42	+0.75	—1.23
1800	23 27 54.80	54.22	55.63	+0.58	—0.83
1850	23 27 31.42	30.99	31.83	+0.43	—0.41
1900	23 27 8.02	7.76	8.03	+0.26	—0.01

The formulæ for reducing the places of the fixed stars, page 280, correspond to the *Star Tables of the American Ephemeris*, Washington, 1869.

The mean right ascensions of stars have been reduced to Newcomb's fundamental standard in the catalogue attached to the *Washington Observations for* 1870, Appendix II, with the following exceptions: The right ascensions of the 48 circumpolar stars north of 60° north declination are from Dr. Gould's *Standard Places of Fundamental Stars*, second edition, United States Coast Survey Office, 1866. Of the twelve stars south of 50° south declination, the positions of β Hydri, α Trianguli Australis, and σ Octantis, have been corrected from data furnished by Dr. Gould; while the remaining nine are, as before, from the *British Nautical Almanac* for 1848.

The right ascensions of additional stars in the general list, for which no apparent places are given in the subsequent section, have been taken partly from the *Catalogue of* 1098 *Standard Clock and Zodiacal Stars*, forming Part IV of Vol. I of *Astronomical Papers Prepared for the Use of the American Ephemeris and Nautical Almanac*, Washington, 1881; and partly from the catalogue of the Ast onomische Gesellschaft of 1878. A few have been derived from recent catalogues without a rigorous reduction for equinox.

The mean declinations of stars are taken from Boss's paper in the *Report of the Northern Boundary Commission*, Washington, 1879, for all stars found therein. The declinations of all the other stars have been reduced to the same standard, except those of the additional ones above, which have been taken partly from the Astronomische Gesellschaft list, and partly from places in recent catalogues. To the apparent places of Sirius and Procyon have been applied the periodic corrections resulting from Auwers's investigations.

The values of these corrections are:—

Year.	Sirius.		Procyon.	
	s	″	s	″
1888.0	$\Delta\alpha = +0.063$	$\Delta\delta = -0.97$	$\Delta\alpha = +0.026$	$\Delta\delta = +0.97$
1889.0	$\Delta\alpha = +0.086$	$\Delta\delta = -0.89$	$\Delta\alpha = +0.036$	$\Delta\delta = +0.90$

The ephemeris of the sun is constructed from HANSEN *and* OLUFSEN'S *Tables du Soleil*, Copenhagen, 1853, except that STRUVE'S aberration has been used. This is equivalent to adding 0″.19 to the true longitudes, but it does not affect the right ascensions and declinations. The sun's rectangular equatorial co-ordinates have been computed from the longitudes and latitudes by the following formulæ:—

$$X = R \cos \lambda$$
$$Y = R \sin \lambda \cos \omega - 19.3\ R\ \beta$$
$$Z = R \sin \lambda \sin \omega + 44.5\ R\ \beta$$

The reductions to mean equinox, 1888.0, are computed by the formulæ,

$$\Delta X' = + Y \sec \omega\ \Delta \lambda \sin 1''$$
$$\Delta Y' = - X \cos \omega\ \Delta \lambda \sin 1'' + Z\ \Delta \omega \sin 1'' - 9.4\ \tau\ R \sin (\lambda + 187°)$$
$$\Delta Z' = - X \sin \omega\ \Delta \lambda \sin 1'' - Y\ \Delta \omega \sin 1'' + 21.7\ \tau\ R \sin (\lambda + 187°)$$

Wherein—

λ and β are the longitude and latitude of the sun referred to the equinox and ecliptic of the date;
ω, the obliquity of the ecliptic;
$\Delta\lambda$, the reduction of longitude for precession and nutation from January 0;
$\Delta\omega$, the reduction of the mean to the apparent obliquity;
τ, the fraction of the year since January 0.

The numerical coefficients are in units of the seventh place of decimals. The correction for latitude has been taken from GOETZE'S paper in the *Astronomical Journal*, Vol. II, page 71.

The mean equatorial horizontal parallax of the sun, adopted from Professor NEWCOMB'S *Investigation of the Distance of the Sun and the Elements which depend on it*,* is 8″.848. The adopted semidiameter of the sun at the earth's mean distance is 16′ 2″. In the computations pertaining to eclipses, BESSEL'S semidiameter, 15′ 59″.788 has been used.

The right ascension, declination and parallax of the moon are derived from HANSEN'S *Tables de la Lune*, London, 1857, the mean longitude being corrected in accordance with NEWCOMB'S *Researches on the Motion of the Moon*, Part I, page 268,† and a corrected table being substituted for Table XXXIV.

The semidiameter of the moon is computed from the moon's horizontal parallax by the formula,

$$S = 0.272274\ \pi + 2''.5$$

The constant 2″.5 is omitted in the computation of eclipses and occultations, as due entirely to telescopic and ocular irradiation.

The ephemeris of Mercury is derived from Professor WINLOCK'S *Tables of Mercury*, Washington, 1864. They are based on the older theory of LE VERRIER, published in the Additions to the *Connaissance des Temps* for 1848.

The ephemeris of Venus is derived from Mr. G. W. HILL'S *Tables of Venus*, Washington, 1872.

The ephemeris of Mars is derived from manuscript tables constructed from LINDENAU'S Tables. Mr. HUGH BREEN'S results, contained in his paper *On the Corrections of* LINDENAU'S *Elements of Mars*, published in the *Memoirs of the Royal Astronomical Society*, Vol. XX, have also been discussed and applied; and LE VERRIER'S secular variations of the elements are likewise adopted. The perturbations produced by Jupiter have been increased by $\frac{1}{30}$ of their value. The following are the corresponding corrected elements and annual variations for Washington, 1855.0:—

$$L = 320^\circ\ 13'\ 33''.87 + 689101''.1527\ t$$
$$\pi = 333\ 23\ 17.84 + 65.9990\ t$$
$$\Omega = 48\ 25\ 55.29 + 27.6997\ t$$
$$i = 1\ 51\ 2.20 - 0.02141\ t$$
$$e = 19238''.75 + 0.18549\ t$$
$$n = 689050''.8927$$
$$a = 1.5236915$$

The ephemeris of Jupiter is derived from manuscript tables constructed from BOUVARD'S Tables, with such changes as were required to make them correspond more nearly to the formulæ.

The ephemeris of Saturn is derived from a provisional theory constructed by Mr. GEORGE W. HILL, and still unpublished.

The ephemerides of Uranus and Neptune are derived from Professor NEWCOMB'S Tables, published by the *Smithsonian Institution*.

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* *Astronomical Observations made at the U. S. Naval Observatory, Washington*, 1865, Appendix II.

† *Astronomical Observations made at the U. S. Naval Observatory, Washington*, 1875, Appendix II.

The semidiameters of the planets are computed from the following values:—

	Semidiameter.	Log Dist.	Authority.
Mercury	3.34	0.00	Le Verrier, *Theory of Mercury.*
Venus	8.546 ± 0.086	0.00	Peirce, from the Washington Observations of 1845 and 1846, made with the Mural Circle.
Mars	2.842 ± 0.057	0.25	
Jupiter (polar)	18.78 ± 0.067	0.70	
Saturn (polar)	8.77 ± 0.039	0.95	
Uranus	1.68 ± 0.3	1.30	
Neptune	1.28	1.48	
Jupiter (equatorial)	20.00	0.70	
Saturn (equatorial)	9.38	0.95	

The elements of eclipses of the sun and occultations of stars by the moon are adapted to Bessel's method, using the special forms in Chauvenet's *Spherical and Practical Astronomy.* The adopted semidiameters are:—

Semidiameter of the sun at distance unity . . . . 959″.788
Ratio of radius of moon to radius of earth . . . 0.27227

The eclipses of Jupiter's satellites are computed from Todd's *Continuation of* Damoiseau's *Tables,* Washington, 1876. The occultations, transits, etc., are computed from Woolhouse's Tables, *British Nautical Almanac* for 1835, Table II of each satellite having been adapted to Damoiseau's Tables.

The elongations and conjunctions of the satellites of Saturn are computed from manuscript tables prepared by Professor Newcomb

The apparent elements of the rings of Saturn are computed from Bessel's data, except those for the dusky ring.

The elongations of the satellites of Uranus, and of the satellite of Neptune are computed from the data of Professor Newcomb's *Uranian and Neptunian Systems,* Washington, 1875.

In compiling the positions of observatories, the latest available data have been used. The positions have been furnished, in many instances, through the courtesy of the directors of the Observatories, in response to a circular issued by the Superintendent of the American Ephemeris.

The reduction to geocentric latitude, and the logarithm of the radius of the earth, are derived from Bessel's elements of the terrestrial spheroid, as adopted in Table III of Chauvenet's *Spherical and Practical Astronomy,* Vol. II:—

$$\log e = 8.9122052$$
$$\varphi' - \varphi = -11'\,30''.65 \sin 2\varphi + 1''.16 \sin 4\varphi$$
$$\log \rho = 9.9992747 + 0.0007271 \cos 2\varphi - 0.0000018 \cos 4\varphi$$

Table IV, for finding the latitude from an observed altitude of Polaris, is constructed for—
(1) An altitude of Polaris equal to 45°.
(2) A declination of Polaris equal to + 88° 42′.4.

The principal computations of the Ephemeris have been distributed in the following manner:—

The sun has been computed by Mr. Eastwood; the moon's longitude, latitude, semidiameter and horizontal parallax, by Professor Keith; right ascension and declination, by Professor Van Vleck; culminations, by Professor Runkle; lunar distances, by Mr. W. B. Oliver; Mercury and Venus, by Mr. E. P. Austin; Mars, Jupiter, Saturn, Uranus, and Neptune, by Mr. Roberdeau Buchanan; Jupiter's satellites, by Mr. W. F. McK. Ritter. The fixed stars have been prepared by Mr. Wiessner and Mr. H. Meier; the general constants for their reduction, by Mr. Wiessner; the occultations, by Mr. J. O. Wiessner; and the eclipses have been computed and the charts projected by Mr. Buchanan.

TABLE I.

CORRECTION REQUIRED, ON ACCOUNT OF SECOND DIFFERENCES OF THE MOON'S MOTION, IN FINDING THE GREENWICH TIME CORRESPONDING TO A CORRECTED LUNAR DISTANCE.

Approximate Interval.		Difference of the Proportional Logarithms in the Ephemeris.																							
		2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52
h m	h m	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s
0 0	3 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0 10	2 50	0	0	0	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3
0 20	2 40	0	1	1	1	1	2	2	2	2	2	3	3	3	3	4	4	4	4	5	5	5	5	6	6	6	6
0 30	2 30	0	1	1	2	2	2	2	3	3	3	4	4	5	5	5	6	6	6	7	7	7	8	8	8	9	9
0 40	2 20	0	1	1	2	2	3	3	3	4	4	5	5	6	6	6	7	7	8	8	9	9	10	10	10	11	11
0 50	2 10	1	1	2	2	3	3	4	4	5	5	5	6	6	7	7	8	8	9	9	10	10	11	12	12	13	13
1 0	2 0	1	1	2	2	3	3	4	4	5	6	6	7	7	8	8	9	9	10	10	11	12	12	13	13	14	14
1 10	1 50	1	1	2	2	3	4	4	5	5	6	6	7	8	8	9	9	10	11	11	12	12	13	14	14	15	15
1 20	1 40	1	1	2	3	3	4	4	5	6	6	7	7	8	9	9	10	10	11	12	12	13	14	14	15	15	16
1 30	1 30	1	1	2	3	3	4	4	5	6	6	7	8	8	9	9	10	11	11	12	12	13	14	14	15	16	16

		Difference of the Proportional Logarithms in the Ephemeris.																							
		54	56	58	60	62	64	66	68	70	72	74	76	78	80	82	84	86	88	90	92	94	96	98	100
h m	h m	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s
0 0	3 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0 10	2 50	4	4	4	4	4	4	4	4	5	5	5	5	5	5	5	6	6	6	6	6	6	6	6	7
0 20	2 40	7	7	7	7	8	8	8	8	9	9	9	9	10	10	10	10	11	11	11	11	12	12	12	12
0 30	2 30	9	10	10	10	11	11	12	12	12	13	13	13	14	14	14	14	15	15	16	16	16	17	17	17
0 40	2 20	12	12	13	13	13	14	14	15	15	16	16	16	17	17	18	18	19	19	19	20	20	21	21	22
0 50	2 10	14	14	15	15	16	16	16	17	17	18	19	19	20	20	21	21	22	22	22	23	23	24	24	25
1 0	2 0	15	16	16	17	17	18	18	19	19	20	21	21	22	22	23	23	24	24	25	25	26	27	27	28
1 10	1 50	16	17	17	18	18	19	19	20	21	21	22	22	23	24	24	25	25	26	27	27	28	28	29	30
1 20	1 40	17	17	18	19	19	20	20	21	21	22	23	23	24	25	25	26	26	27	28	28	29	29	30	31
1 30	1 30	17	18	18	19	19	20	21	21	22	23	23	24	24	25	25	26	27	27	28	29	29	30	31	31

		Difference of the Proportional Logarithms in the Ephemeris.																							
		102	104	106	108	110	112	114	116	118	120	122	124	126	128	130	132	134	136	138					
h m	h m	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s					
0 0	3 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
0 10	2 50	7	7	7	7	7	7	7	8	8	8	8	8	8	8	8	9	9	9	9					
0 20	2 40	13	13	13	13	14	14	14	14	15	15	15	15	15	16	16	16	16	17	17					
0 30	2 30	18	18	18	19	19	19	20	20	20	21	21	21	22	22	22	23	23	24	24					
0 40	2 20	22	22	23	23	24	24	25	25	25	26	26	27	27	28	28	28	29	29	30					
0 50	2 10	26	26	26	27	27	28	29	29	29	30	30	31	31	32	32	33	33	34	34					
1 0	2 0	28	29	29	30	30	31	31	32	33	33	34	34	35	35	36	37	37	38	38					
1 10	1 50	30	31	31	32	32	33	34	34	35	35	36	37	37	38	38	39	40	40	41					
1 20	1 40	31	32	33	33	34	34	35	35	36	37	38	38	39	39	40	41	41	42	42					
1 30	1 30	32	32	33	34	34	35	35	36	36	37	38	39	39	40	40	41	42	42	43					

The correction is to be added to the approximate Greenwich time when the proportional logarithms in the Ephemeris are decreasing, and subtracted when they are increasing.

TABLE II.—SIDEREAL INTO MEAN SOLAR TIME.

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.

Sidereal.	0h.	1h.	2h.	3h.	4h.	5h.	6h.	7h.	For Seconds.
m	m s	m s	m s	m s	m s	m s	m s	m s	s s
0	0 0.000	0 9.830	0 19.659	0 29.489	0 39.318	0 49.148	0 58.977	1 8.807	0 0.000
1	0 0.164	0 9.993	0 19.823	0 29.653	0 39.482	0 49.312	0 59.141	1 8.971	1 0.003
2	0 0.328	0 10.157	0 19.987	0 29.816	0 39.646	0 49.475	0 59.305	1 9.135	2 0.005
3	0 0.491	0 10.321	0 20.151	0 29.980	0 39.810	0 49.639	0 59.469	1 9.298	3 0.008
4	0 0.655	0 10.485	0 20.314	0 30.144	0 39.974	0 49.803	0 59.633	1 9.462	4 0.011
5	0 0.819	0 10.649	0 20.478	0 30.308	0 40.137	0 49.967	0 59.796	1 9.626	5 0.014
6	0 0.983	0 10.813	0 20.642	0 30.472	0 40.301	0 50.131	0 59.960	1 9.790	6 0.016
7	0 1.147	0 10.976	0 20.806	0 30.635	0 40.465	0 50.295	1 0.124	1 9.954	7 0.019
8	0 1.311	0 11.140	0 20.970	0 30.799	0 40.629	0 50.458	1 0.288	1 10.118	8 0.022
9	0 1.474	0 11.304	0 21.134	0 30.963	0 40.793	0 50.622	1 0.452	1 10.281	9 0.025
10	0 1.638	0 11.468	0 21.297	0 31.127	0 40.956	0 50.786	1 0.616	1 10.445	10 0.027
11	0 1.802	0 11.632	0 21.461	0 31.291	0 41.120	0 50.950	1 0.779	1 10.609	11 0.030
12	0 1.966	0 11.795	0 21.625	0 31.455	0 41.284	0 51.114	1 0.943	1 10.773	12 0.033
13	0 2.130	0 11.959	0 21.789	0 31.618	0 41.448	0 51.278	1 1.107	1 10.937	13 0.035
14	0 2.294	0 12.123	0 21.953	0 31.782	0 41.612	0 51.441	1 1.271	1 11.100	14 0.038
15	0 2.457	0 12.287	0 22.117	0 31.946	0 41.776	0 51.605	1 1.435	1 11.264	15 0.041
16	0 2.621	0 12.451	0 22.280	0 32.110	0 41.939	0 51.769	1 1.599	1 11.428	16 0.044
17	0 2.785	0 12.615	0 22.444	0 32.274	0 42.103	0 51.933	1 1.762	1 11.592	17 0.046
18	0 2.949	0 12.778	0 22.608	0 32.438	0 42.267	0 52.097	1 1.926	1 11.756	18 0.049
19	0 3.113	0 12.942	0 22.772	0 32.601	0 42.431	0 52.260	1 2.090	1 11.920	19 0.052
20	0 3.277	0 13.106	0 22.936	0 32.765	0 42.595	0 52.424	1 2.254	1 12.083	20 0.055
21	0 3.440	0 13.270	0 23.099	0 32.929	0 42.759	0 52.588	1 2.418	1 12.247	21 0.057
22	0 3.604	0 13.434	0 23.263	0 33.093	0 42.922	0 52.752	1 2.582	1 12.411	22 0.060
23	0 3.768	0 13.598	0 23.427	0 33.257	0 43.086	0 52.916	1 2.745	1 12.575	23 0.063
24	0 3.932	0 13.761	0 23.591	0 33.420	0 43.250	0 53.080	1 2.909	1 12.739	24 0.066
25	0 4.096	0 13.925	0 23.755	0 33.584	0 43.414	0 53.243	1 3.073	1 12.903	25 0.068
26	0 4.259	0 14.089	0 23.919	0 33.748	0 43.578	0 53.407	1 3.237	1 13.066	26 0.071
27	0 4.423	0 14.253	0 24.082	0 33.912	0 43.742	0 53.571	1 3.401	1 13.230	27 0.074
28	0 4.587	0 14.417	0 24.246	0 34.076	0 43.905	0 53.735	1 3.564	1 13.394	28 0.076
29	0 4.751	0 14.581	0 24.410	0 34.240	0 44.069	0 53.899	1 3.728	1 13.558	29 0.079
30	0 4.915	0 14.744	0 24.574	0 34.403	0 44.233	0 54.063	1 3.892	1 13.722	30 0.082
31	0 5.079	0 14.908	0 24.738	0 34.567	0 44.397	0 54.226	1 4.056	1 13.886	31 0.085
32	0 5.242	0 15.072	0 24.902	0 34.731	0 44.561	0 54.390	1 4.220	1 14.049	32 0.087
33	0 5.406	0 15.236	0 25.065	0 34.895	0 44.724	0 54.554	1 4.384	1 14.213	33 0.090
34	0 5.570	0 15.400	0 25.229	0 35.059	0 44.888	0 54 718	1 4.547	1 14.377	34 0.093
35	0 5.734	0 15.563	0 25.393	0 35.223	0 45.052	0 54.882	1 4.711	1 14.541	35 0.096
36	0 5.898	0 15.727	0 25.557	0 35.386	0 45.216	0 55.046	1 4.875	1 14.705	36 0.098
37	0 6.062	0 15.891	0 25.721	0 35.550	0 45.380	0 55.209	1 5.039	1 14.868	37 0.101
38	0 6.225	0 16.055	0 25.885	0 35.714	0 45.544	0 55.373	1 5.203	1 15.032	38 0.104
39	0 6.389	0 16.219	0 26.048	0 35.878	0 45.707	0 55.537	1 5.367	1 15.196	39 0.106
40	0 6.553	0 16.383	0 26.212	0 36.042	0 45.871	0 55.701	1 5.530	1 15.360	40 0.109
41	0 6.717	0 16.546	0 26.376	0 36.206	0 46.035	0 55.865	1 5.694	1 15.524	41 0.112
42	0 6.881	0 16.710	0 26.540	0 36.369	0 46.199	0 56.028	1 5.858	1 15.688	42 0.115
43	0 7.045	0 16.874	0 26.704	0 36.533	0 46.363	0 56.192	1 6.022	1 15.851	43 0.117
44	0 7.208	0 17.038	0 26.867	0 36.697	0 46.527	0 56.356	1 6.186	1 16.015	44 0.120
45	0 7.372	0 17.202	0 27.031	0 36.861	0 46.690	0 56.520	1 6.350	1 16.179	45 0.123
46	0 7.536	0 17.366	0 27.195	0 37.025	0 46.854	0 56.684	1 6.513	1 16.343	46 0.126
47	0 7.700	0 17.529	0 27.359	0 37.188	0 47.018	0 56.848	1 6.677	1 16.507	47 0.128
48	0 7.864	0 17.693	0 27.523	0 37.352	0 47.182	0 57.011	1 6.841	1 16.671	48 0.131
49	0 8.027	0 17.857	0 27.687	0 37.516	0 47.346	0 57.175	1 7.005	1 16.834	49 0.134
50	0 8.191	0 18.021	0 27.850	0 37.680	0 47.510	0 57.339	1 7.169	1 16.998	50 0.137
51	0 8.355	0 18.185	0 28.014	0 37.844	0 47.673	0 57.503	1 7.332	1 17.162	51 0.139
52	0 8.519	0 18.349	0 28.178	0 38.008	0 47.837	0 57.667	1 7.496	1 17.326	52 0.142
53	0 8.683	0 18.512	0 28.342	0 38.171	0 48.001	0 57.831	1 7.660	1 17.490	53 0.145
54	0 8.847	0 18.676	0 28.506	0 38.335	0 48.165	0 57.994	1 7.824	1 17.654	54 0.147
55	0 9.010	0 18.840	0 28.670	0 38.499	0 48.329	0 58.158	1 7.988	1 17.817	55 0.150
56	0 9.174	0 19.004	0 28.833	0 38.663	0 48.492	0 58.322	1 8.152	1 17.981	56 0.153
57	0 9.338	0 19.168	0 28.997	0 38.827	0 48.656	0 58.486	1 8.315	1 18.145	57 0.156
58	0 9.502	0 19.331	0 29.161	0 38.991	0 48.820	0 58.650	1 8.479	1 18.309	58 0.158
59	0 9.666	0 19.495	0 29.325	0 39.154	0 48.984	0 58.814	1 8.643	1 18.473	59 0.161
Sidereal.	0h.	1h.	2h.	3h.	4h.	5h.	6h.	7h.	For Seconds.

TABLE II.—SIDEREAL INTO MEAN SOLAR TIME.

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.

Sidereal.	8^h.	9^h.	10^h.	11^h.	12^h.	13^h.	14^h.	15^h.	For Seconds.
m	m s	m s	m s	m s	m s	m s	m s	m s	s s
0	1 18.636	1 28.466	1 38.296	1 48.125	1 57.955	2 7.784	2 17.614	2 27.443	0 0.000
1	1 18.800	1 28.630	1 38.459	1 48.289	1 58.119	2 7.948	2 17.778	2 27.607	1 0.003
2	1 18.964	1 28.794	1 38.623	1 48.453	1 58.282	2 8.112	2 17.941	2 27.771	2 0.005
3	1 19.128	1 28.958	1 38.787	1 48.617	1 58.446	2 8.276	2 18.105	2 27.935	3 0.008
4	1 19.292	1 29.121	1 38.951	1 48.780	1 58.610	2 8.440	2 18.269	2 28.099	4 0.011
5	1 19.456	1 29.285	1 39.115	1 48.944	1 58.774	2 8.603	2 18.433	2 28.263	5 0.014
6	1 19.619	1 29.449	1 39.279	1 49.108	1 58.938	2 8.767	2 18.597	2 28.426	6 0.016
7	1 19.783	1 29.613	1 39.442	1 49.272	1 59.101	2 8.931	2 18.761	2 28.590	7 0.019
8	1 19.947	1 29.777	1 39.606	1 49.436	1 59.265	2 9.095	2 18.924	2 28.754	8 0.022
9	1 20.111	1 29.940	1 39.770	1 49.600	1 59.429	2 9.259	2 19.088	2 28.918	9 0.025
10	1 20.275	1 30.104	1 39.934	1 49.763	1 59.593	2 9.423	2 19.252	2 29.082	10 0.027
11	1 20.439	1 30.268	1 40.098	1 49.927	1 59.757	2 9.586	2 19.416	2 29.245	11 0.030
12	1 20.602	1 30.432	1 40.261	1 50.091	1 59.921	2 9.750	2 19.580	2 29.409	12 0.033
13	1 20.766	1 30.596	1 40.425	1 50.255	2 0.084	2 9.914	2 19.744	2 29.573	13 0.035
14	1 20.930	1 30.760	1 40.589	1 50.419	2 0.248	2 10.078	2 19.907	2 29.737	14 0.038
15	1 21.094	1 30.923	1 40.753	1 50.583	2 0.412	2 10.242	2 20.071	2 29.901	15 0.041
16	1 21.258	1 31.087	1 40.917	1 50.746	2 0.576	2 10.405	2 20.235	2 30.065	16 0.044
17	1 21.422	1 31.251	1 41.081	1 50.910	2 0.740	2 10.569	2 20.399	2 30.228	17 0.046
18	1 21.585	1 31.415	1 41.244	1 51.074	2 0.904	2 10.733	2 20.563	2 30.392	18 0.049
19	1 21.749	1 31.579	1 41.408	1 51.238	2 1.067	2 10.897	2 20.727	2 30.556	19 0.052
20	1 21.913	1 31.743	1 41.572	1 51.402	2 1.231	2 11.061	2 20.890	2 30.720	20 0.055
21	1 22.077	1 31.906	1 41.736	1 51.565	2 1.395	2 11.225	2 21.054	2 30.884	21 0.057
22	1 22.241	1 32.070	1 41.900	1 51.729	2 1.559	2 11.388	2 21.218	2 31.048	22 0.060
23	1 22.404	1 32.234	1 42.064	1 51.893	2 1.723	2 11.552	2 21.382	2 31.211	23 0.063
24	1 22.568	1 32.398	1 42.227	1 52.057	2 1.887	2 11.716	2 21.546	2 31.375	24 0.066
25	1 22.732	1 32.562	1 42.391	1 52.221	2 2.050	2 11.880	2 21.709	2 31.539	25 0.068
26	1 22.896	1 32.726	1 42.555	1 52.385	2 2.214	2 12.044	2 21.873	2 31.703	26 0.071
27	1 23.060	1 32.889	1 42.719	1 52.548	2 2.378	2 12.208	2 22.037	2 31.867	27 0.074
28	1 23.224	1 33.053	1 42.883	1 52.712	2 2.542	2 12.371	2 22.201	2 32.031	28 0.076
29	1 23.387	1 33.217	1 43.047	1 52.876	2 2.706	2 12.535	2 22.365	2 32.194	29 0.079
30	1 23.551	1 33.381	1 43.210	1 53.040	2 2.869	2 12.699	2 22.529	2 32.358	30 0.082
31	1 23.715	1 33.545	1 43.374	1 53.204	2 3.033	2 12.863	2 22.692	2 32.522	31 0.085
32	1 23.879	1 33.708	1 43.538	1 53.368	2 3.197	2 13.027	2 22.856	2 32.686	32 0.087
33	1 24.043	1 33.872	1 43.702	1 53.531	2 3.361	2 13.191	2 23.020	2 32.850	33 0.090
34	1 24.207	1 34.036	1 43.866	1 53.695	2 3.525	2 13.354	2 23.184	2 33.013	34 0.093
35	1 24.370	1 34.200	1 44.029	1 53.859	2 3.689	2 13.518	2 23.348	2 33.177	35 0.096
36	1 24.534	1 34.364	1 44.193	1 54.023	2 3.852	2 13.682	2 23.512	2 33.341	36 0.098
37	1 24.698	1 34.528	1 44.357	1 54.187	2 4.016	2 13.846	2 23.675	2 33.505	37 0.101
38	1 24.862	1 34.691	1 44.521	1 54.351	2 4.180	2 14.010	2 23.839	2 33.669	38 0.104
39	1 25.026	1 34.855	1 44.685	1 54.514	2 4.344	2 14.173	2 24.003	2 33.833	39 0.106
40	1 25.190	1 35.019	1 44.849	1 54.678	2 4.508	2 14.337	2 24.167	2 33.996	40 0.109
41	1 25.353	1 35.183	1 45.012	1 54.842	2 4.672	2 14.501	2 24.331	2 34.160	41 0.112
42	1 25.517	1 35.347	1 45.176	1 55.006	2 4.835	2 14.665	2 24.495	2 34.324	42 0.115
43	1 25.681	1 35.511	1 45.340	1 55.170	2 4.999	2 14.829	2 24.658	2 34.488	43 0.117
44	1 25.845	1 35.674	1 45.504	1 55.333	2 5.163	2 14.993	2 24.822	2 34.652	44 0.120
45	1 26.009	1 35.838	1 45.668	1 55.497	2 5.327	2 15.156	2 24.986	2 34.816	45 0.123
46	1 26.172	1 36.002	1 45.832	1 55.661	2 5.491	2 15.320	2 25.150	2 34.979	46 0.126
47	1 26.336	1 36.166	1 45.995	1 55.825	2 5.655	2 15.484	2 25.314	2 35.143	47 0.128
48	1 26.500	1 36.330	1 46.159	1 55.989	2 5.818	2 15.648	2 25.477	2 35.307	48 0.131
49	1 26.664	1 36.493	1 46.323	1 56.153	2 5.982	2 15.812	2 25.641	2 35.471	49 0.134
50	1 26.828	1 36.657	1 46.487	1 56.316	2 6.146	2 15.976	2 25.805	2 35.635	50 0.137
51	1 26.992	1 36.821	1 46.651	1 56.480	2 6.310	2 16.139	2 25.969	2 35.798	51 0.139
52	1 27.155	1 36.985	1 46.815	1 56.644	2 6.474	2 16.303	2 26.133	2 35.962	52 0.142
53	1 27.319	1 37.149	1 46.978	1 56.808	2 6.637	2 16.467	2 26.297	2 36.126	53 0.145
54	1 27.483	1 37.313	1 47.142	1 56.972	2 6.801	2 16.631	2 26.460	2 36.290	54 0.147
55	1 27.647	1 37.476	1 47.306	1 57.136	2 6.965	2 16.795	2 26.624	2 36.454	55 0.150
56	1 27.811	1 37.640	1 47.470	1 57.299	2 7.129	2 16.959	2 26.788	2 36.618	56 0.153
57	1 27.975	1 37.804	1 47.634	1 57.463	2 7.293	2 17.122	2 26.952	2 36.781	57 0.156
58	1 28.138	1 37.968	1 47.797	1 57.627	2 7.457	2 17.286	2 27.116	2 36.945	58 0.158
59	1 28.302	1 38.132	1 47.961	1 57.791	2 7.620	2 17.450	2 27.280	2 37.109	59 0.161
Sidereal.	8^h.	9^h.	10^h.	11^h.	12^h.	13^h.	14^h.	15^h.	For Seconds.

TABLE II.—SIDEREAL INTO MEAN SOLAR TIME.

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.

Sidereal.	16h.	17h.	18h.	19h.	20h.	21h.	22h.	23h.	For Seconds.
m	m s	m s	m s	m s	m s	m s	m s	m s	s s
0	2 37.273	2 47.102	2 56.932	3 6.762	3 16.591	3 26.421	3 36.250	3 46.080	0 0.000
1	2 37.437	2 47.266	2 57.096	3 6.925	3 16.755	3 26.585	3 36.414	3 46.244	1 0.003
2	2 37.601	2 47.430	2 57.260	3 7.089	3 16.919	3 26.748	3 36.578	3 46.407	2 0.005
3	2 37.764	2 47.594	2 57.424	3 7.253	3 17.083	3 26.912	3 36.742	3 46.571	3 0.008
4	2 37.928	2 47.758	2 57.587	3 7.417	3 17.246	3 27.076	3 36.906	3 46.735	4 0.011
5	2 38.092	2 47.922	2 57.751	3 7.581	3 17.410	3 27.240	3 37.069	3 46.899	5 0.014
6	2 38.256	2 48.085	2 57.915	3 7.745	3 17.574	3 27.404	3 37.233	3 47.063	6 0.016
7	2 38.420	2 48.249	2 58.079	3 7.908	3 17.738	3 27.568	3 37.397	3 47.227	7 0.019
8	2 38.584	2 48.413	2 58.243	3 8.072	3 17.902	3 27.731	3 37.561	3 47.390	8 0.022
9	2 38.747	2 48.577	2 58.406	3 8.236	3 18.066	3 27.895	3 37.725	3 47.554	9 0.025
10	2 38.911	2 48.741	2 58.570	3 8.400	3 18.229	3 28.059	3 37.889	3 47.718	10 0.027
11	2 39.075	2 48.905	2 58.734	3 8.564	3 18.393	3 28.223	3 38.052	3 47.882	11 0.030
12	2 39.239	2 49.068	2 58.898	3 8.728	3 18.557	3 28.387	3 38.216	3 48.046	12 0.033
13	2 39.403	2 49.232	2 59.062	3 8.891	3 18.721	3 28.550	3 38.380	3 48.210	13 0.035
14	2 39.566	2 49.396	2 59.226	3 9.055	3 18.885	3 28.714	3 38.544	3 48.373	14 0.038
15	2 39.730	2 49.560	2 59.389	3 9.219	3 19.049	3 28.878	3 38.708	3 48.537	15 0.041
16	2 39.894	2 49.724	2 59.553	3 9.383	3 19.212	3 29.042	3 38.871	3 48.701	16 0.044
17	2 40.058	2 49.888	2 59.717	3 9.547	3 19.376	3 29.206	3 39.035	3 48.865	17 0.046
18	2 40.222	2 50.051	2 59.881	3 9.710	3 19.540	3 29.370	3 39.199	3 49.029	18 0.049
19	2 40.386	2 50.215	3 0.045	3 9.874	3 19.704	3 29.533	3 39.363	3 49.193	19 0.052
20	2 40.549	2 50.379	3 0.209	3 10.038	3 19.868	3 29.697	3 39.527	3 49.356	20 0.055
21	2 40.713	2 50.543	3 0.372	3 10.202	3 20.032	3 29.861	3 39.691	3 49.520	21 0.057
22	2 40.877	2 50.707	3 0.536	3 10.366	3 20.195	3 30.025	3 39.854	3 49.684	22 0.060
23	2 41.041	2 50.870	3 0.700	3 10.530	3 20.359	3 30.189	3 40.018	3 49.848	23 0.063
24	2 41.205	2 51.034	3 0.864	3 10.693	3 20.523	3 30.353	3 40.182	3 50.012	24 0.066
25	2 41.369	2 51.198	3 1.028	3 10.857	3 20.687	3 30.516	3 40.346	3 50.175	25 0.068
26	2 41.532	2 51.362	3 1.192	3 11.021	3 20.851	3 30.680	3 40.510	3 50.339	26 0.071
27	2 41.696	2 51.526	3 1.355	3 11.185	3 21.014	3 30.844	3 40.674	3 50.503	27 0.074
28	2 41.860	2 51.690	3 1.519	3 11.349	3 21.178	3 31.008	3 40.837	3 50.667	28 0.076
29	2 42.024	2 51.853	3 1.683	3 11.513	3 21.342	3 31.172	3 41.001	3 50.831	29 0.079
30	2 42.188	2 52.017	3 1.847	3 11.676	3 21.506	3 31.336	3 41.165	3 50.995	30 0.082
31	2 42.352	2 52.181	3 2.011	3 11.840	3 21.670	3 31.499	3 41.329	3 51.158	31 0.085
32	2 42.515	2 52.345	3 2.174	3 12.004	3 21.834	3 31.663	3 41.493	3 51.322	32 0.087
33	2 42.679	2 52.509	3 2.338	3 12.168	3 21.997	3 31.827	3 41.657	3 51.486	33 0.090
34	2 42.843	2 52.673	3 2.502	3 12.332	3 22.161	3 31.991	3 41.820	3 51.650	34 0.093
35	2 43.007	2 52.836	3 2.666	3 12.496	3 22.325	3 32.155	3 41.984	3 51.814	35 0.096
36	2 43.171	2 53.000	3 2.830	3 12.659	3 22.489	3 32.318	3 42.148	3 51.978	36 0.098
37	2 43.334	2 53.164	3 2.994	3 12.823	3 22.653	3 32.482	3 42.312	3 52.141	37 0.101
38	2 43.498	2 53.328	3 3.157	3 12.987	3 22.817	3 32.646	3 42.476	3 52.305	38 0.104
39	2 43.662	2 53.492	3 3.321	3 13.151	3 22.980	3 32.810	3 42.639	3 52.469	39 0.106
40	2 43.826	2 53.656	3 3.485	3 13.315	3 23.144	3 32.974	3 42.803	3 52.633	40 0.109
41	2 43.990	2 53.819	3 3.649	3 13.478	3 23.308	3 33.138	3 42.967	3 52.797	41 0.112
42	2 44.154	2 53.983	3 3.813	3 13.642	3 23.472	3 33.301	3 43.131	3 52.961	42 0.115
43	2 44.317	2 54.147	3 3.977	3 13.806	3 23.636	3 33.465	3 43.295	3 53.124	43 0.117
44	2 44.481	2 54.311	3 4.140	3 13.970	3 23.800	3 33.629	3 43.459	3 53.288	44 0.120
45	2 44.645	2 54.475	3 4.304	3 14.134	3 23.963	3 33.793	3 43.622	3 53.452	45 0.123
46	2 44.809	2 54.638	3 4.468	3 14.298	3 24.127	3 33.957	3 43.786	3 53.616	46 0.126
47	2 44.973	2 54.802	3 4.632	3 14.461	3 24.291	3 34.121	3 43.950	3 53.780	47 0.128
48	2 45.137	2 54.966	3 4.796	3 14.625	3 24.455	3 34.284	3 44.114	3 53.943	48 0.131
49	2 45.300	2 55.130	3 4.960	3 14.789	3 24.619	3 34.448	3 44.278	3 54.107	49 0.134
50	2 45.464	2 55.294	3 5.123	3 14.953	3 24.782	3 34.612	3 44.442	3 54.271	50 0.137
51	2 45.628	2 55.458	3 5.287	3 15.117	3 24.946	3 34.776	3 44.605	3 54.435	51 0.139
52	2 45.792	2 55.621	3 5.451	3 15.281	3 25.110	3 34.940	3 44.769	3 54.599	52 0.142
53	2 45.956	2 55.785	3 5.615	3 15.444	3 25.274	3 35.104	3 44.933	3 54.763	53 0.145
54	2 46.120	2 55.949	3 5.779	3 15.608	3 25.438	3 35.267	3 45.097	3 54.926	54 0.147
55	2 46.283	2 56.113	3 5.942	3 15.772	3 25.602	3 35.431	3 45.261	3 55.090	55 0.150
56	2 46.447	2 56.277	3 6.106	3 15.936	3 25.765	3 35.595	3 45.425	3 55.254	56 0.153
57	2 46.611	2 56.441	3 6.270	3 16.100	3 25.929	3 35.759	3 45.588	3 55.418	57 0.156
58	2 46.775	2 56.604	3 6.434	3 16.264	3 26.093	3 35.923	3 45.752	3 55.582	58 0.158
59	2 46.939	2 56.768	3 6.598	3 16.427	3 26.257	3 36.086	3 45.916	3 55.746	59 0.161
Sidereal.	16h.	17h.	18h.	19h.	20h.	21h.	22h.	23h.	For Seconds.

TABLE III.—MEAN SOLAR INTO SIDEREAL TIME.

TO BE ADDED TO A MEAN TIME INTERVAL.

Mean Solar.	0h.	1h.	2h.	3h.	4h.	5h.	6h.	7h.	For Seconds.
m	m s	m s	m s	m s	m s	m s	m s	m s	s s
0	0 0.000	0 9.856	0 19.713	0 29.569	0 39.426	0 49.282	0 59.139	1 8.995	0 0.000
1	0 0.164	0 10.021	0 19.877	0 29.734	0 39.590	0 49.447	0 59.303	1 9.160	1 0.003
2	0 0.329	0 10.185	0 20.041	0 29.898	0 39.754	0 49.611	0 59.467	1 9.324	2 0.005
3	0 0.493	0 10.349	0 20.206	0 30.062	0 39.919	0 49.775	0 59.632	1 9.488	3 0.008
4	0 0.657	0 10.514	0 20.370	0 30.227	0 40.083	0 49.939	0 59.796	1 9.652	4 0.011
5	0 0.821	0 10.678	0 20.534	0 30.391	0 40.247	0 50.104	0 59.960	1 9.817	5 0.014
6	0 0.986	0 10.842	0 20.699	0 30.555	0 40.412	0 50.268	1 0.124	1 9.981	6 0.016
7	0 1.150	0 11.006	0 20.863	0 30.719	0 40.576	0 50.432	1 0.289	1 10.145	7 0.019
8	0 1.314	0 11.171	0 21.027	0 30.884	0 40.740	0 50.597	1 0.453	1 10.310	8 0.022
9	0 1.478	0 11.335	0 21.191	0 31.048	0 40.904	0 50.761	1 0.617	1 10.474	9 0.025
10	0 1.643	0 11.499	0 21.356	0 31.212	0 41.069	0 50.925	1 0.782	1 10.638	10 0.027
11	0 1.807	0 11.663	0 21.520	0 31.376	0 41.233	0 51.089	1 0.946	1 10.802	11 0.030
12	0 1.971	0 11.828	0 21.684	0 31.541	0 41.397	0 51.254	1 1.110	1 10.967	12 0.033
13	0 2.136	0 11.992	0 21.849	0 31.705	0 41.561	0 51.418	1 1.274	1 11.131	13 0.036
14	0 2.300	0 12.156	0 22.013	0 31.869	0 41.726	0 51.582	1 1.439	1 11.295	14 0.038
15	0 2.464	0 12.321	0 22.177	0 32.034	0 41.890	0 51.746	1 1.603	1 11.459	15 0.041
16	0 2.628	0 12.485	0 22.341	0 32.198	0 42.054	0 51.911	1 1.767	1 11.624	16 0.044
17	0 2.793	0 12.649	0 22.506	0 32.362	0 42.219	0 52.075	1 1.932	1 11.788	17 0.047
18	0 2.957	0 12.813	0 22.670	0 32.526	0 42.383	0 52.239	1 2.096	1 11.952	18 0.049
19	0 3.121	0 12.978	0 22.834	0 32.691	0 42.547	0 52.404	1 2.260	1 12.117	19 0.052
20	0 3.285	0 13.142	0 22.998	0 32.855	0 42.711	0 52.568	1 2.424	1 12.281	20 0.055
21	0 3.450	0 13.306	0 23.163	0 33.019	0 42.876	0 52.732	1 2.589	1 12.445	21 0.057
22	0 3.614	0 13.471	0 23.327	0 33.183	0 43.040	0 52.896	1 2.753	1 12.609	22 0.060
23	0 3.778	0 13.635	0 23.491	0 33.348	0 43.204	0 53.061	1 2.917	1 12.774	23 0.063
24	0 3.943	0 13.799	0 23.656	0 33.512	0 43.368	0 53.225	1 3.081	1 12.938	24 0.066
25	0 4.107	0 13.963	0 23.820	0 33.676	0 43.533	0 53.389	1 3.246	1 13.102	25 0.068
26	0 4.271	0 14.128	0 23.984	0 33.841	0 43.697	0 53.554	1 3.410	1 13.266	26 0.071
27	0 4.435	0 14.292	0 24.148	0 34.005	0 43.861	0 53.718	1 3.574	1 13.431	27 0.074
28	0 4.600	0 14.456	0 24.313	0 34.169	0 44.026	0 53.882	1 3.739	1 13.595	28 0.077
29	0 4.764	0 14.620	0 24.477	0 34.333	0 44.190	0 54.046	1 3.903	1 13.759	29 0.079
30	0 4.928	0 14.785	0 24.641	0 34.498	0 44.354	0 54.211	1 4.067	1 13.924	30 0.082
31	0 5.093	0 14.949	0 24.805	0 34.662	0 44.518	0 54.375	1 4.231	1 14.088	31 0.085
32	0 5.257	0 15.113	0 24.970	0 34.826	0 44.683	0 54.539	1 4.396	1 14.252	32 0.088
33	0 5.421	0 15.278	0 25.134	0 34.990	0 44.847	0 54.703	1 4.560	1 14.416	33 0.090
34	0 5.585	0 15.442	0 25.298	0 35.155	0 45.011	0 54.868	1 4.724	1 14.581	34 0.093
35	0 5.750	0 15.606	0 25.463	0 35.319	0 45.176	0 55.032	1 4.888	1 14.745	35 0.096
36	0 5.914	0 15.770	0 25.627	0 35.483	0 45.340	0 55.196	1 5.053	1 14.909	36 0.099
37	0 6.078	0 15.935	0 25.791	0 35.648	0 45.504	0 55.361	1 5.217	1 15.073	37 0.101
38	0 6.242	0 16.099	0 25.955	0 35.812	0 45.668	0 55.525	1 5.381	1 15.238	38 0.104
39	0 6.407	0 16.263	0 26.120	0 35.976	0 45.833	0 55.689	1 5.546	1 15.402	39 0.107
40	0 6.571	0 16.427	0 26.284	0 36.140	0 45.997	0 55.853	1 5.710	1 15.566	40 0.110
41	0 6.735	0 16.592	0 26.448	0 36.305	0 46.161	0 56.018	1 5.874	1 15.731	41 0.112
42	0 6.900	0 16.756	0 26.612	0 36.469	0 46.325	0 56.182	1 6.038	1 15.895	42 0.115
43	0 7.064	0 16.920	0 26.777	0 36.633	0 46.490	0 56.346	1 6.203	1 16.059	43 0.118
44	0 7.228	0 17.085	0 26.941	0 36.798	0 46.654	0 56.510	1 6.367	1 16.223	44 0.120
45	0 7.392	0 17.249	0 27.105	0 36.962	0 46.818	0 56.675	1 6.531	1 16.388	45 0.123
46	0 7.557	0 17.413	0 27.270	0 37.126	0 46.983	0 56.839	1 6.695	1 16.552	46 0.126
47	0 7.721	0 17.577	0 27.434	0 37.290	0 47.147	0 57.003	1 6.860	1 16.716	47 0.129
48	0 7.885	0 17.742	0 27.598	0 37.455	0 47.311	0 57.168	1 7.024	1 16.881	48 0.131
49	0 8.049	0 17.906	0 27.762	0 37.619	0 47.475	0 57.332	1 7.188	1 17.045	49 0.134
50	0 8.214	0 18.070	0 27.927	0 37.783	0 47.640	0 57.496	1 7.353	1 17.209	50 0.137
51	0 8.378	0 18.234	0 28.091	0 37.947	0 47.804	0 57.660	1 7.517	1 17.373	51 0.140
52	0 8.542	0 18.399	0 28.255	0 38.112	0 47.968	0 57.825	1 7.681	1 17.538	52 0.142
53	0 8.707	0 18.563	0 28.420	0 38.276	0 48.132	0 57.989	1 7.845	1 17.702	53 0.145
54	0 8.871	0 18.727	0 28.584	0 38.440	0 48.297	0 58.153	1 8.010	1 17.866	54 0.148
55	0 9.035	0 18.892	0 28.748	0 38.605	0 48.461	0 58.317	1 8.174	1 18.030	55 0.151
56	0 9.199	0 19.056	0 28.912	0 38.769	0 48.625	0 58.482	1 8.338	1 18.195	56 0.153
57	0 9.364	0 19.220	0 29.077	0 38.933	0 48.790	0 58.646	1 8.502	1 18.359	57 0.156
58	0 9.528	0 19.384	0 29.241	0 39.097	0 48.954	0 58.810	1 8.667	1 18.523	58 0.159
59	0 9.692	0 19.549	0 29.405	0 39.262	0 49.118	0 58.975	1 8.831	1 18.688	59 0.162
Mean Solar.	0h.	1h.	2h.	3h.	4h.	5h.	6h.	7h.	For Seconds.

TABLE III.—MEAN SOLAR INTO SIDEREAL TIME.

TO BE ADDED TO A MEAN TIME INTERVAL.

Mean Solar.	8h.	9h.	10h.	11h.	12h.	13h.	14h.	15h.	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	1 18.852	1 28.708	1 38.565	1 48.421	1 58.278	2 8.134	2 17.991	2 27.847	0	0.000
1	1 19.016	1 28.873	1 38.729	1 48.585	1 58.442	2 8.298	2 18.155	2 28.011	1	0.003
2	1 19.180	1 29.037	1 38.893	1 48.750	1 58.606	2 8.463	2 18.319	2 28.176	2	0.005
3	1 19.345	1 29.201	1 39.058	1 48.914	1 58.771	2 8.627	2 18.483	2 28.340	3	0.008
4	1 19.509	1 29.365	1 39.222	1 49.078	1 58.935	2 8.791	2 18.648	2 28.504	4	0.011
5	1 19.673	1 29.530	1 39.386	1 49.243	1 59.099	2 8.956	2 18.812	2 28.668	5	0.014
6	1 19.837	1 29.694	1 39.550	1 49.407	1 59.263	2 9.120	2 18.976	2 28.833	6	0.016
7	1 20.002	1 29.858	1 39.715	1 49.571	1 59.428	2 9.284	2 19.141	2 28.997	7	0.019
8	1 20.166	1 30.022	1 39.879	1 49.735	1 59.592	2 9.448	2 19.305	2 29.161	8	0.022
9	1 20.330	1 30.187	1 40 043	1 49.900	1 59.756	2 9.613	2 19.469	2 29.326	9	0.025
10	1 20.495	1 30.351	1 40.207	1 50.064	1 59.920	2 9.777	2 19.633	2 29.490	10	0.027
11	1 20.659	1 30.515	1 40.372	1 50.228	2 0.085	2 9.941	2 19.798	2 29.654	11	0.030
12	1 20.823	1 30.680	1 40.536	1 50.393	2 0.249	2 10.105	2 19.962	2 29.818	12	0.033
13	1 20.987	1 30.844	1 40.700	1 50.557	2 0.413	2 10.270	2 20.126	2 29.983	13	0.036
14	1 21.152	1 31.008	1 40.865	1 50.721	2 0.578	2 10.434	2 20.290	2 30.147	14	0.038
15	1 21.316	1 31.172	1 41.029	1 50.885	2 0.742	2 10.598	2 20.455	2 30.311	15	0.041
16	1 21.480	1 31.337	1 41.193	1 51.050	2 0.906	2 10.763	2 20.619	2 30.476	16	0.044
17	1 21.644	1 31.501	1 41.357	1 51.214	2 1.070	2 10.927	2 20.783	2 30.640	17	0.047
18	1 21.809	1 31.665	1 41.522	1 51.378	2 1.235	2 11.091	2 20.948	2 30.804	18	0.049
19	1 21.973	1 31.829	1 41.686	1 51.542	2 1.399	2 11.255	2 21.112	2 30.968	19	0.052
20	1 22.137	1 31.994	1 41.850	1 51.707	2 1.563	2 11.420	2 21.276	2 31.133	20	0.055
21	1 22.302	1 32.158	1 42.015	1 51.871	2 1.727	2 11.584	2 21.440	2 31.297	21	0.057
22	1 22.466	1 32.322	1 42.179	1 52.035	2 1.892	2 11.748	2 21.605	2 31.461	22	0.060
23	1 22.630	1 32.487	1 42.343	1 52.200	2 2.056	2 11.912	2 21.769	2 31.625	23	0.063
24	1 22.794	1 32.651	1 42.507	1 52.364	2 2.220	2 12.077	2 21.933	2 31.790	24	0.066
25	1 22.959	1 32.815	1 42.672	1 52.528	2 2.385	2 12.241	2 22.098	2 31.954	25	0.068
26	1 23.123	1 32.979	1 42.836	1 52.692	2 2.549	2 12.405	2 22.262	2 32.118	26	0.071
27	1 23.287	1 33.144	1 43.000	1 52.857	2 2.713	2 12.570	2 22.426	2 32.283	27	0.074
28	1 23.451	1 33.308	1 43.164	1 53.021	2 2.877	2 12.734	2 22.590	2 32.447	28	0.077
29	1 23.616	1 33.472	1 43.329	1 53.185	2 3.042	2 12.898	2 22.755	2 32.611	29	0.079
30	1 23.780	1 33.637	1 43.493	1 53.349	2 3.206	2 13.062	2 22.919	2 32.775	30	0.082
31	1 23.944	1 33.801	1 43.657	1 53.514	2 3.370	2 13.227	2 23.083	2 32.940	31	0.085
32	1 24.109	1 33.965	1 43.822	1 53.678	2 3.534	2 13.391	2 23.247	2 33.104	32	0.088
33	1 24.273	1 34.129	1 43.986	1 53.842	2 3.699	2 13.555	2 23.412	2 33.268	33	0.090
34	1 24.437	1 34.294	1 44.150	1 54.007	2 3.863	2 13.720	2 23.576	2 33.432	34	0.093
35	1 24.601	1 34.458	1 44.314	1 54.171	2 4.027	2 13.884	2 23.740	2 33.597	35	0.096
36	1 24.766	1 34.622	1 44.479	1 54.335	2 4.192	2 14.048	2 23.905	2 33.761	36	0.099
37	1 24.930	1 34.786	1 44.643	1 54.499	2 4.356	2 14.212	2 24.069	2 33.925	37	0.101
38	1 25.094	1 34.951	1 44.807	1 54.664	2 4.520	2 14.377	2 24.233	2 34.090	38	0.104
39	1 25.259	1 35.115	1 44.971	1 54.828	2 4.684	2 14.541	2 24.397	2 34.254	39	0.107
40	1 25.423	1 35.279	1 45.136	1 54.992	2 4.849	2 14.705	2 24.562	2 34.418	40	0.110
41	1 25.587	1 35.444	1 45.300	1 55.156	2 5.013	2 14.869	2 24.726	2 34.582	41	0.112
42	1 25.751	1 35.608	1 45.464	1 55.321	2 5.177	2 15.034	2 24.890	2 34.747	42	0.115
43	1 25.916	1 35.772	1 45.629	1 55.485	2 5.342	2 15.198	2 25.054	2 34.911	43	0.118
44	1 26.080	1 35.936	1 45.793	1 55.649	2 5.506	2 15.362	2 25.219	2 35.075	44	0.120
45	1 26.244	1 36.101	1 45.957	1 55.814	2 5.670	2 15.527	2 25.383	2 35.239	45	0.123
46	1 26.408	1 36.265	1 46.121	1 55.978	2 5.834	2 15.691	2 25.547	2 35.404	46	0.126
47	1 26.573	1 36.429	1 46.286	1 56.142	2 5.999	2 15.855	2 25.712	2 35.568	47	0.129
48	1 26.737	1 36.593	1 46.450	1 56.306	2 6.163	2 16.019	2 25.876	2 35.732	48	0.131
49	1 26.901	1 36.758	1 46.614	1 56.471	2 6.327	2 16.184	2 26.040	2 35.897	49	0.134
50	1 27.066	1 36.922	1 46.778	1 56.635	2 6.491	2 16.348	2 26.204	2 36.061	50	0.137
51	1 27.230	1 37.086	1 46.943	1 56.799	2 6.656	2 16.512	2 26.369	2 36.225	51	0.140
52	1 27.394	1 37.251	1 47.107	1 56.964	2 6.820	2 16.676	2 26.533	2 36.389	52	0.142
53	1 27.558	1 37.415	1 47.271	1 57.128	2 6.984	2 16.841	2 26.697	2 36.554	53	0.145
54	1 27.723	1 37.579	1 47.436	1 57.292	2 7.149	2 17.005	2 26.861	2 36.718	54	0.148
55	1 27.887	1 37.743	1 47.600	1 57.456	2 7.313	2 17.169	2 27.026	2 36.882	55	0.151
56	1 28.051	1 37.908	1 47.764	1 57.621	2 7.477	2 17.334	2 27.190	2 37.047	56	0.153
57	1 28.215	1 38.072	1 47.928	1 57.785	2 7.641	2 17.498	2 27.354	2 37.211	57	0.156
58	1 28.380	1 38.236	1 48.093	1 57.949	2 7.806	2 17.662	2 27.519	2 37.375	58	0.159
59	1 28.544	1 38.400	1 48.257	1 58.113	2 7.970	2 17.826	2 27.683	2 37.539	59	0.162
Mean Solar.	8h.	9h.	10h.	11h.	12h.	13h.	14h.	15h.	For Seconds.	

TABLE III.—MEAN SOLAR INTO SIDEREAL TIME.

TO BE ADDED TO A MEAN TIME INTERVAL.

Mean Solar.	16h.	17h.	18h.	19h.	20h.	21h.	22h.	23h.	For Seconds.
m	m s	m s	m s	m s	m s	m s	m s	m s	s s
0	2 37.704	2 47.560	2 57.417	3 7.273	3 17.129	3 26.986	3 36.842	3 46.699	0 0.000
1	2 37.868	2 47.724	2 57.581	3 7.437	3 17.294	3 27.150	3 37.007	3 46.863	1 0.003
2	2 38.032	2 47.889	2 57.745	3 7.602	3 17.458	3 27.315	3 37.171	3 47.027	2 0.005
3	2 38.196	2 48.053	2 57.909	3 7.766	3 17.622	3 27.479	3 37.335	3 47.192	3 0.008
4	2 38.361	2 48.217	2 58.074	3 7.930	3 17.787	3 27.643	3 37.500	3 47.356	4 0.011
5	2 38.525	2 48.381	2 58.238	3 8.094	3 17.951	3 27.807	3 37.664	3 47.520	5 0.014
6	2 38.689	2 48.546	2 58.402	3 8.259	3 18.115	3 27.972	3 37.828	3 47.685	6 0.016
7	2 38.854	2 48.710	2 58.566	3 8.423	3 18.279	3 28.136	3 37.992	3 47.849	7 0.019
8	2 39.018	2 48.874	2 58.731	3 8.587	3 18.444	3 28.300	3 38.157	3 48.013	8 0.022
9	2 39.182	2 49.039	2 58.895	3 8.751	3 18.608	3 28.464	3 38.321	3 48.177	9 0.025
10	2 39.346	2 49.203	2 59.059	3 8.916	3 18.772	3 28.629	3 38.485	3 48.342	10 0.027
11	2 39.511	2 49.367	2 59.224	3 9.080	3 18.937	3 28.793	3 38.649	3 48.506	11 0.030
12	2 39.675	2 49.531	2 59.388	3 9.244	3 19.101	3 28.957	3 38.814	3 48.670	12 0.033
13	2 39.839	2 49.696	2 59.552	3 9.409	3 19.265	3 29.122	3 38.978	3 48.834	13 0.036
14	2 40.003	2 49.860	2 59.716	3 9.573	3 19.429	3 29.286	3 39.142	3 48.999	14 0.038
15	2 40.168	2 50.024	2 59.881	3 9.737	3 19.594	3 29.450	3 39.307	3 49.163	15 0.041
16	2 40.332	2 50.188	3 0.045	3 9.901	3 19.758	3 29.614	3 39.471	3 49.327	16 0.044
17	2 40.496	2 50.353	3 0.209	3 10.066	3 19.922	3 29.779	3 39.635	3 49.492	17 0.047
18	2 40.661	2 50.517	3 0.373	3 10.230	3 20.086	3 29.943	3 39.799	3 49.656	18 0.049
19	2 40.825	2 50.681	3 0.538	3 10.394	3 20.251	3 30.107	3 39.964	3 49.820	19 0.052
20	2 40.989	2 50.846	3 0.702	3 10.559	3 20.415	3 30.271	3 40.128	3 49.984	20 0.055
21	2 41.153	2 51.010	3 0.866	3 10.723	3 20.579	3 30.436	3 40.292	3 50.149	21 0.057
22	2 41.318	2 51.174	3 1.031	3 10.887	3 20.744	3 30.600	3 40.456	3 50.313	22 0.060
23	2 41.482	2 51.338	3 1.195	3 11.051	3 20.908	3 30.764	3 40.621	3 50.477	23 0.063
24	2 41.646	2 51.503	3 1.359	3 11.216	3 21.072	3 30.929	3 40.785	3 50.642	24 0.066
25	2 41.810	2 51.667	3 1.523	3 11.380	3 21.236	3 31.093	3 40.949	3 50.806	25 0.068
26	2 41.975	2 51.831	3 1.688	3 11.544	3 21.401	3 31.257	3 41.114	3 50.970	26 0.071
27	2 42.139	2 51.995	3 1.852	3 11.708	3 21.565	3 31.421	3 41.278	3 51.134	27 0.074
28	2 42.303	2 52.160	3 2.016	3 11.873	3 21.729	3 31.586	3 41.442	3 51.299	28 0.077
29	2 42.468	2 52.324	3 2.181	3 12.037	3 21.893	3 31.750	3 41.606	3 51.463	29 0.079
30	2 42.632	2 52.488	3 2.345	3 12.201	3 22.058	3 31.914	3 41.771	3 51.627	30 0.082
31	2 42.796	2 52.653	3 2.509	3 12.366	3 22.222	3 32.078	3 41.935	3 51.791	31 0.085
32	2 42.960	2 52.817	3 2.673	3 12.530	3 22.386	3 32.243	3 42.099	3 51.956	32 0.088
33	2 43.125	2 52.981	3 2.838	3 12.694	3 22.551	3 32.407	3 42.264	3 52.120	33 0.090
34	2 43.289	2 53.145	3 3.002	3 12.858	3 22.715	3 32.571	3 42.428	3 52.284	34 0.093
35	2 43.453	2 53.310	3 3.166	3 13.023	3 22.879	3 32.736	3 42.592	3 52.449	35 0.096
36	2 43.617	2 53.474	3 3.330	3 13.187	3 23.043	3 32.900	3 42.756	3 52.613	36 0.099
37	2 43.782	2 53.638	3 3.495	3 13.351	3 23.208	3 33.064	3 42.921	3 52.777	37 0.101
38	2 43.946	2 53.803	3 3.659	3 13.515	3 23.372	3 33.228	3 43.085	3 52.941	38 0.104
39	2 44.110	2 53.967	3 3.823	3 13.680	3 23.536	3 33.393	3 43.249	3 53.106	39 0.107
40	2 44.275	2 54.131	3 3.988	3 13.844	3 23.700	3 33.557	3 43.413	3 53.270	40 0.110
41	2 44.439	2 54.295	3 4.152	3 14.008	3 23.865	3 33.721	3 43.578	3 53.434	41 0.112
42	2 44.603	2 54.460	3 4.316	3 14.173	3 24.029	3 33.886	3 43.742	3 53.598	42 0.115
43	2 44.767	2 54.624	3 4.480	3 14.337	3 24.193	3 34.050	3 43.906	3 53.763	43 0.118
44	2 44.932	2 54.788	3 4.645	3 14.501	3 24.358	3 34.214	3 44.071	3 53.927	44 0.120
45	2 45.096	2 54.952	3 4.809	3 14.665	3 24.522	3 34.378	3 44.235	3 54.091	45 0.123
46	2 45.260	2 55.117	3 4.973	3 14.830	3 24.686	3 34.543	3 44.399	3 54.256	46 0.126
47	2 45.425	2 55.281	3 5.137	3 14.994	3 24.850	3 34.707	3 44.563	3 54.420	47 0.129
48	2 45.589	2 55.445	3 5.302	3 15.158	3 25.015	3 34.871	3 44.728	3 54.584	48 0.131
49	2 45.753	2 55.610	3 5.466	3 15.322	3 25.179	3 35.035	3 44.892	3 54.748	49 0.134
50	2 45.917	2 55.774	3 5.630	3 15.487	3 25.343	3 35.200	3 45.056	3 54.913	50 0.137
51	2 46.082	2 55.938	3 5.795	3 15.651	3 25.508	3 35.364	3 45.220	3 55.077	51 0.140
52	2 46.246	2 56.102	3 5.959	3 15.815	3 25.672	3 35.528	3 45.385	3 55.241	52 0.142
53	2 46.410	2 56.267	3 6.123	3 15.980	3 25.836	3 35.693	3 45.549	3 55.405	53 0.145
54	2 46.574	2 56.431	3 6.287	3 16.144	3 26.000	3 35.857	3 45.713	3 55.570	54 0.148
55	2 46.739	2 56.595	3 6.452	3 16.308	3 26.165	3 36.021	3 45.878	3 55.734	55 0.151
56	2 46.903	2 56.759	3 6.616	3 16.472	3 26.329	3 36.185	3 46.042	3 55.898	56 0.153
57	2 47.067	2 56.924	3 6.780	3 16.637	3 26.493	3 36.350	3 46.206	3 56.063	57 0.156
58	2 47.232	2 57.088	3 6.944	3 16.801	3 26.657	3 36.514	3 46.370	3 56.227	58 0.159
59	2 47.396	2 57.252	3 7.109	3 16.965	3 26.822	3 36.678	3 46.535	3 56.391	59 0.162
Mean Solar	16h.	17h.	18h.	19h.	20h.	21h.	22h.	23h.	For Seconds.

TABLE IV.—LATITUDE BY POLARIS.

TABLE FOR FINDING THE LATITUDE BY AN OBSERVED ALTITUDE OF POLARIS.

Reduce the observed altitude of Polaris to the true altitude.

Reduce the recorded time of observation to local sidereal time.

If the sidereal time is { less than $1^h\ 17^m.6$, subtract it from $1^h\ 17^m.6$; between $1^h\ 17^m.6$ and $13^h\ 17^m.6$, subtract $1^h\ 17^m.6$ from it; greater than $13^h\ 17^m.6$, subtract it from $25^h\ 17^m.6$;

and the remainder is the hour-angle of Polaris.

With this hour-angle take out the correction from Table IV, and add it to or subtract it from the true altitude, according to its sign. The result is the latitude of the place.

Example.—1888, November 10, at $9^h\ 29^m\ 29^s$, P. M., mean solar time, in longitude 29° east of Greenwich, suppose the true altitude of Polaris to be 29° 29′: required the latitude of the place.

	h m s
Local astronomical mean time	9 29 29
Reduction from Table III, for $9^h\ 29^m\ 29^s$	+ 1 34
Greenwich sidereal time of mean noon, November 10, page 183	15 20 17.5
Reduction from Table III, for longitude (= $1^h\ 56^m$ east, or minus)	— 0 19
Sum (having regard to signs) is equal to local sidereal time	0 51 1.5
	h m s
	1 17 36
Subtract sidereal time	0 51 1.5
Remainder is equal to hour-angle of Polaris	0 26 34.5

True altitude	+ 29° 29′.0
Correction from Table IV.	— 1 16.7
Latitude	+ 28 12.3

TABLE IV—1888.

Hour-Angle.	0^h.		1^h.		2^h.		3^h.		4^h.		5^h.	
m	° ′	′	° ′	′	° ′	′	° ′	′	° ′	′	° ′	′
0	− 1 17.3	0.0	− 1 14.7	0.5	− 1 6.9	0.9	− 0 54.7	1.2	− 0 38.6	1.4	− 0 20.0	1.6
5	1 17.3	+0.1	1 14.2	0.5	1 6.0	0.9	0 53.5	1.2	0 37.2	1.5	0 18.4	1.6
10	1 17.2	0.1	1 13.7	0.5	1 5.1	0.9	0 52.3	1.3	0 35.7	1.5	0 16.8	1.7
15	1 17.1	0.1	1 13.2	0.6	1 4.2	0.9	0 51.0	1.3	0 34.2	1.5	0 15.1	1.7
20	− 1 17.0	0.2	− 1 12.6	0.6	− 1 3.3	1.0	− 0 49.7	1.3	− 0 32.7	1.5	− 0 13.4	1.7
25	1 16.8	0.2	1 12.0	0.6	1 2.3	1.0	0 48.4	1.3	0 31.2	1.6	0 11.7	1.6
30	1 16.6	0.2	1 11.4	0.6	1 1.3	1.0	0 47.1	1.4	0 29.6	1.6	0 10.1	1.7
35	1 16.4	0.3	1 10.8	0.7	1 0.3	1.1	0 45.7	1.4	0 28.0	1.6	0 8.4	1.7
40	− 1 16.1	0.3	− 1 10.1	0.8	− 0 59.2	1.1	− 0 44.3	1.4	− 0 26.4	1.6	− 0 6.7	1.6
45	1 15.8	0.3	1 9.3	0.8	0 58.1	1.1	0 42.9	1.4	0 24.8	1.6	0 5.1	1.7
50	1 15.5	0.4	1 8.5	0.8	0 57.0	1.1	0 41.5	1.4	0 23.2	1.6	0 3.4	1.7
55	1 15.1	0.4	1 7.7	0.8	0 55.9	1.2	0 40.1	1.5	0 21.6	1.6	− 0 1.7	1.7
60	− 1 14.7		− 1 6.9		− 0 54.7		− 0 38.6		− 0 20.0		+ 0 0.01	

Hour-Angle.	6^h.		7^h.		8^h.		9^h.		10^h.		11^h.	
m	° ′	′	° ′	′	° ′	′	° ′	′	° ′	′	° ′	′
0	+ 0 0.01	1.7	+ 0 20.0	1.6	+ 0 38.6	1.5	+ 0 54.7	1.2	+ 1 6.9	0.8	+ 1 14.7	0.4
5	0 1.7	1.7	0 21.6	1.6	0 40.1	1.4	0 55.9	1.1	1 7.7	0.8	1 15.1	0.4
10	0 3.4	1.7	0 23.2	1.6	0 41.5	1.4	0 57.0	1.1	1 8.5	0.8	1 15.5	0.3
15	0 5.1	1.6	0 24.8	1.6	0 42.9	1.4	0 58.1	1.1	1 9.3	0.8	1 15.8	0.3
20	+ 0 6.7	1.7	+ 0 26.4	1.6	+ 0 44.3	1.4	+ 0 59.2	1.1	+ 1 10.1	0.7	+ 1 16.1	0.3
25	0 8.4	1.7	0 28.0	1.6	0 45.7	1.4	1 0.3	1.0	1 10.8	0.6	1 16.4	0.2
30	0 10.1	1.6	0 29.6	1.6	0 47.1	1.3	1 1.3	1.0	1 11.4	0.6	1 16.6	0.2
35	0 11.7	1.7	0 31.2	1.5	0 48.4	1.3	1 2.3	1.0	1 12.0	0.6	1 16.8	0.2
40	+ 0 13.4	1.7	+ 0 32.7	1.5	+ 0 49.7	1.3	+ 1 3.3	0.9	+ 1 12.6	0.6	+ 1 17.0	0.1
45	0 15.1	1.7	0 34.2	1.5	0 51.0	1.3	1 4.2	0.9	1 13.2	0.5	1 17.1	0.1
50	0 16.8	1.6	0 35.7	1.5	0 52.3	1.2	1 5.1	0.9	1 13.7	0.5	1 17.2	0.1
55	0 18.4	1.6	0 37.2	1.4	0 53.5	1.2	1 6.0	0.9	1 14.2	0.5	1 17.3	0.0
60	+ 0 20.0		+ 0 38.6		+ 0 54.7		+ 1 6.9		+ 1 14.7		+ 1 17.3	

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